

# THE *Soybean Digest*



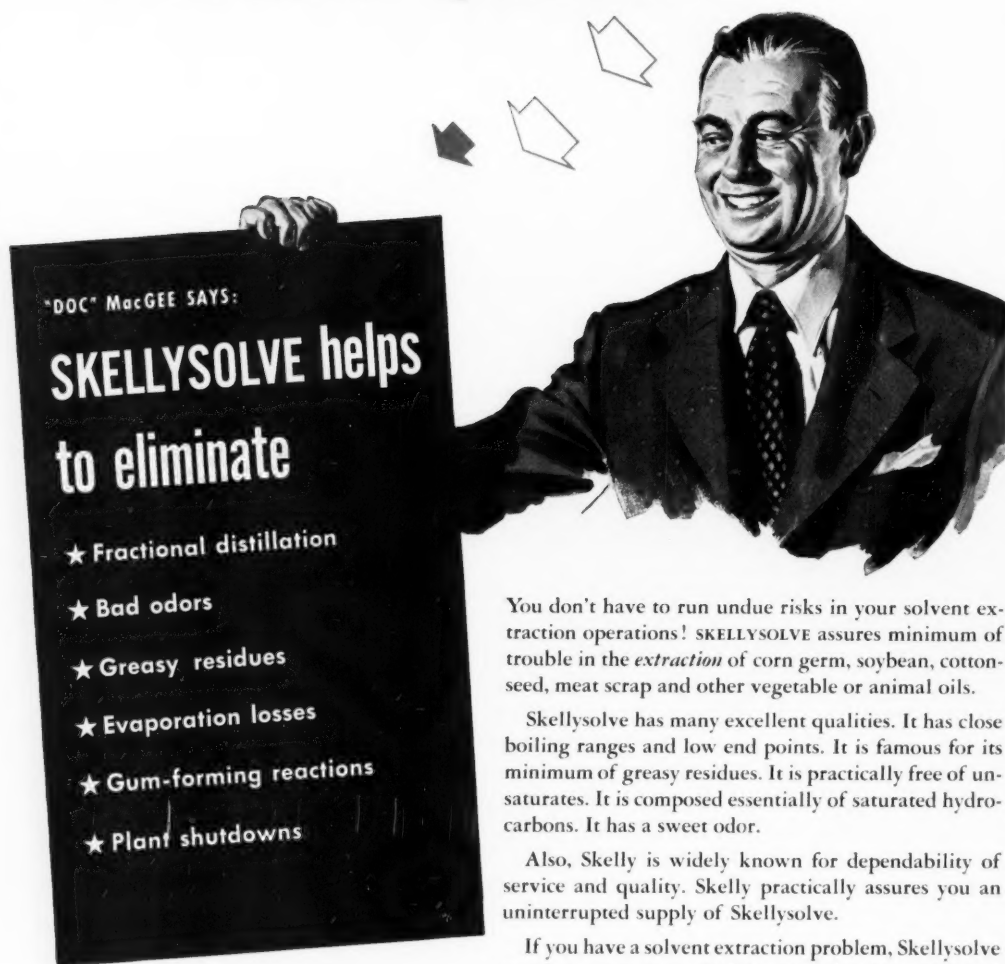
*Official Publication*

AMERICAN SOYBEAN ASSOCIATION

VOLUME 12 NUMBER 1

DECEMBER 7, 1940

# How to Reduce Solvent Risks in Extraction Operations...



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to eliminate**

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- ★ Bad odors
- ★ Greasy residues
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SOLVENTS DIVISION, SKELLY OIL COMPANY, KANSAS CITY, MO.

# THE Soybean Digest

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HUDSON, IOWA

Business, publication and circulation offices, Hudson, Iowa. Editor, Geo. M. Strayer. Managing Editor, Kent Pellett. Business Manager, Geo. McCulley. Director of Circulation, Gene Taylor.

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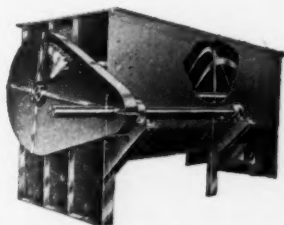
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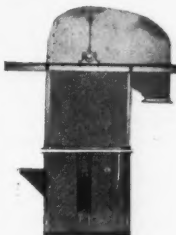
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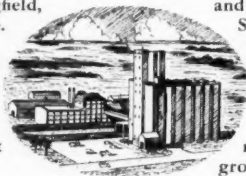
Hoisting  
Mixing



## The Miraculous *SOY BEAN* and the M. & St. L.

**T**he Minneapolis & St. Louis Railway again salutes the mighty Soy Bean industry, which in 1950 is playing a greater part than ever before in agricultural and industrial progress. The American Soybean Association, founded in 1920, is holding its 30th annual convention August 28-29-30 in Springfield, capital of America's No. 1 Soy Bean State.

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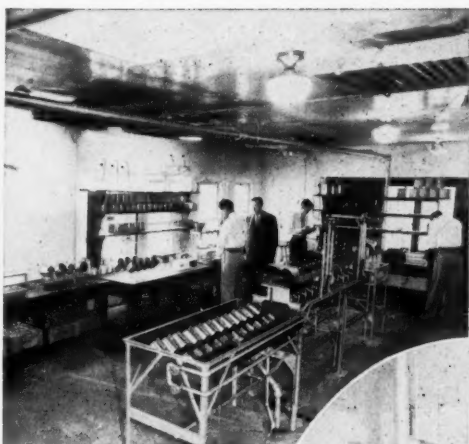
**Diesel Locomotives now power all M. & St. L. Freight Trains**

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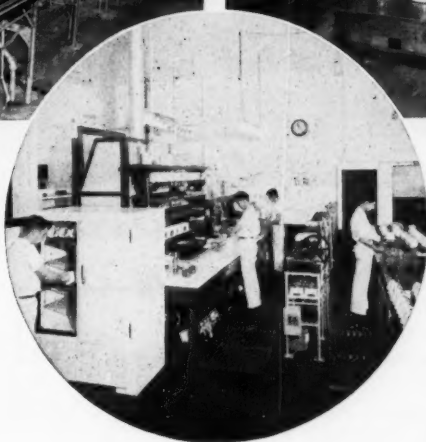
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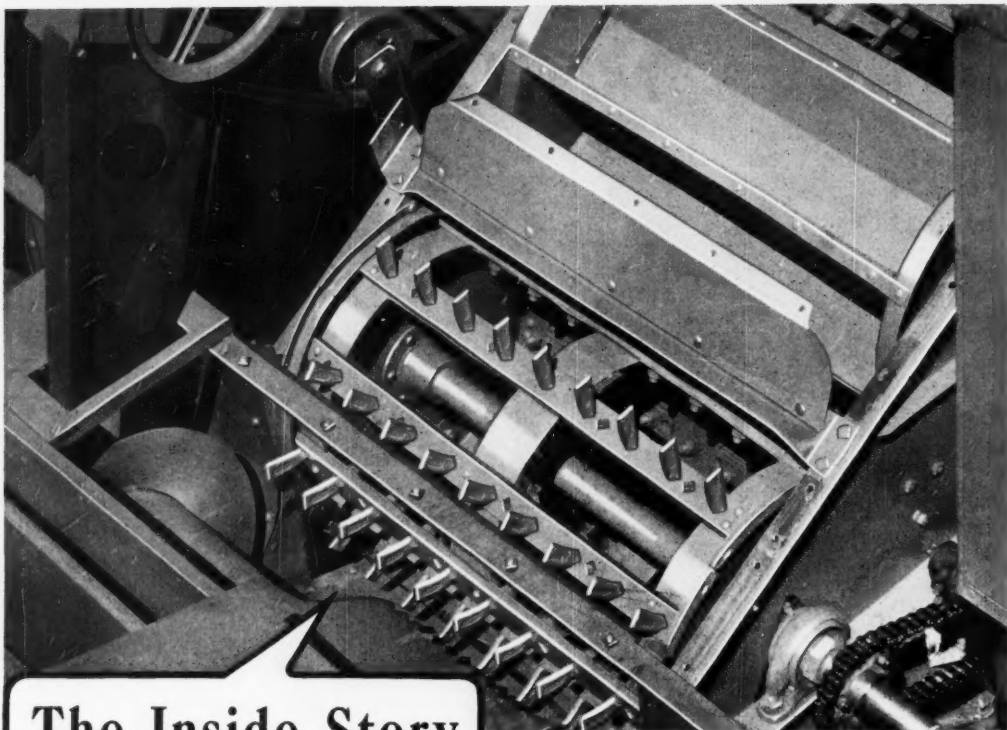
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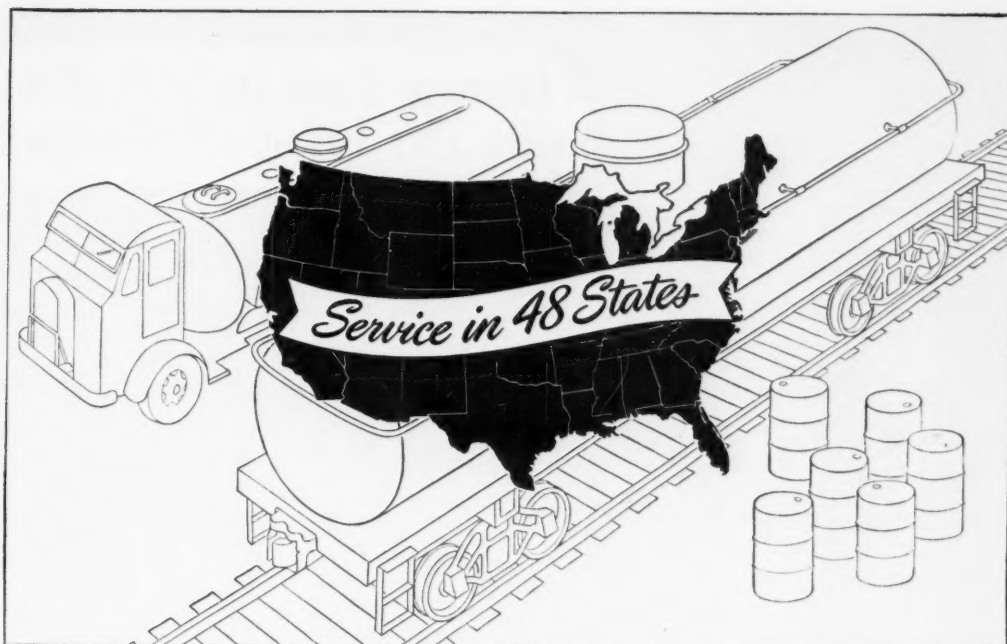
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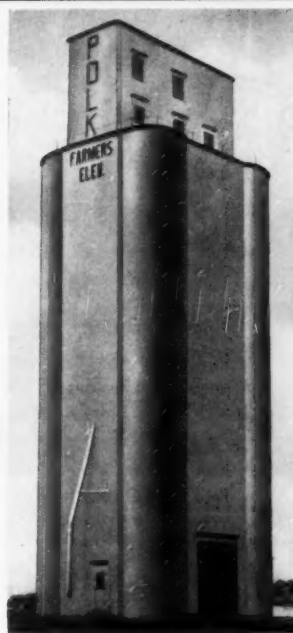
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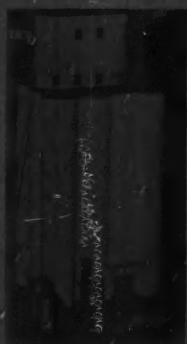
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SEPTEMBER, 1950

13

# 30th Annual Convention



**To sum it all up:**  
All groups in the soybean industry must make the necessary effort to unite in a common cause to promote and popularize soybeans and soy products. If we can do so the soybean will become not a half-billion-dollar crop as at present but a billion or a 2-billion or a 4-billion-dollar crop.

Over 500 producers, seedsmen, soybean buyers, processors and others in the industry attended the 3 days of the 30th annual convention of the American Soybean Association in Springfield, Ill., Aug. 28-30.

The third day for processors and grain buyers was well attended, and a considerable number of those participating in the educational and promotional program of the American Soybean Association were at the courtesy luncheon given by the Association.

John W. Evans, Easthome Farm, Montevideo, Minn., was elected president for a second term. He reported an eventful and constructive year in his annual address.

Chester Biddle, Biddle Farms, Remington, Ind., was elected vice president, succeeding Jake Hartz, Jr., Stuttgart, Ark., who remains on the

board of directors. Biddle was elected to the board in 1949. Geo. M. Strayer, Hudson, Iowa, was reelected secretary-treasurer. Strayer has been executive officer of the Association since 1940.

Herbert L. Huddleston, Lamont, Miss., was elected to the board of directors. Mississippi has had no representative on the board during the past year. David G. Wing, Mechanicsburg, Ohio, was elected to a 2-year term as director, succeeding G. G. McIlroy. Wing and McIlroy, the retiring director, are both veteran members of the board, both are past presidents of the Association and have been in its service for many years.

Reelected to 2-year terms as directors were Strayer; Calvin Heilman, Kenton, Ohio; Henry I. Cohn, St. Louis, Mo.; LeRoy Pike, Pontiac, Ill.; and O. H. Acom, Wardell, Mo.

Three hundred and fifty-seven people attended the annual banquet in the Elks Club Building to take part in group singing led by Wendell Kennedy, assistant director of professional and public relations for the Illinois Education Association; hear the Shamrock Four male quartet; see the Abe Lincoln Players' version of the Lincoln-Douglas debates; see the presentation of honorary life memberships by Jake Hartz, Jr.; and hear the address by Illinois' senior senator Scott W. Lucas.

Dr. W. L. Burlison, head of the department of agronomy at the University of Illinois, was toastmaster.

Corsages for the ladies at the banquet were donated by International Harvester Co., and sprays at head tables were presented by the Springfield Chamber of Commerce and Cargill, Inc., at Springfield.

The reception in the Elks Club Building preceding the banquet drew a capacity crowd. It was sponsored by Illinois Grain Co., Jacob Hartz Seed Co., Valley Farms, Inc., and Quincy Soybean Products Co.

About 40 women went on the women's day tour to the Lincoln memorials and the Pillsbury Mills, Inc., test kitchens and Premix plant at Springfield. Pillsbury sponsored the noon luncheon for the women at Wagon Wheel Inn.

Following are the committees who were in charge of the convention:

**Convention:** Geo. M. Strayer, Hudson, Iowa, chairman; LeRoy Pike, Pontiac, Ill.; and C. G. Simcox, Assumption, Ill.

**Nominations:** Ersel Walley, Fort Wayne, Ind., chairman; Jacob Hartz, Sr., Stuttgart, Ark.; and Frank Garwood, Stonington, Ill.

**Resolutions:** Henry I. Cohn, Sr., St. Louis, Mo., chairman; Robert Peck, River Canard, Ontario; Chester Biddle, Remington, Ind.; Ersel Walley, Fort Wayne, Ind.; and Calvin Heilman, Kenton, Ohio.

Relaxation at the annual banquet. Left to right around the table: E. S. Herron, Gilman, Ill.; C. R. Weber, Ames, Iowa; Mrs. John Gray and John Gray, Baton Rouge, La.; Mrs. J. L. Cartier and J. L. Cartier, Urbana, Ill.; Raymond Reiterman, Mt. Sterling, Ohio; and Lawrence Farlow, Bloomington, Ill.

H. I. Cohn, Sr., St. Louis Mo., and Mrs. John W. Evans, Montevideo, Minn., converse pleasantly while Charles H. Clark, Albert Dickinson Co., Chicago, comments to Mrs. LeRoy Pike, Pontiac, Ill.

—All photos by Kent Pellett of Soybean Digest except one of women's tour bottom page 16. Captions read left to right.





**Awards:** Jake Hartz, Jr., Stuttgart, Ark., chairman; O. H. Acom, Wardell, Mo.; and J. W. Calland, Decatur, Ind.

## Annual Report of the President

The objectives of the American Soybean Association as set forth at last year's convention have been the goal of your officers and directors this past year. These objectives centered around such subjects as: possible acreage controls, scientific research, export trade, legislation, utilization of soybean products, and a stronger financial picture for the association.

In 1948, suggestions were frequently made that soybeans should be given a rating of a basic crop. This title seemed flattering. After discussing the principle involved, and the possible complications, at last year's convention, a policy for 1950 was set up to avoid acreage controls for the 1950 crop, and this independent policy may have aided the final decision in Washington in January not to include soybeans as a basic crop, or impose acreage restrictions. Your officers made the necessary contacts, and we were given a very friendly hearing on the matter by Secretary of Agriculture Brannan, in January.

Soybeans have never been a surplus crop. We have been wise to encourage greater acreage production this past season, and I have met no one who has not felt that United States economy would absorb the 270 million bushels that are predicted for the season. The protein feed market suggests a wide need for soybean oil meal, and the oil market has been strong all summer; that is, strong compared to 1948.

This increase of production can do several things. It can stabilize our market price by insuring an available supply. A low price in harvest season, followed by a sky rocketing price level when no one has any beans to sell, does not inspire confidence in the trade by either farmer or processor. With the needs of industry assured, we can then, with proper logic, work for an export market to absorb what beans are not needed for domestic uses.

The passage of the margarine tax repeal law by congress called for considera-

tion by your board of directors as to the possible effect on consumption of edible oils, and your president, at appropriate times, set up necessary committees to represent the Association in such deliberations. My predecessor, Ersel Walley, as chairman of our business and promotion committee has been very active on the above subject, and no doubt will enlighten you in his report.

Your president, vice president and secretary took active steps last winter to head off a proposed reduction in basic research appropriations for the U. S. Department of Agriculture, one particular item of \$900,000 being involved. A project covered by a certain contract between the University of Pittsburgh and the U. S. Department of Agriculture was threatened. This contract covered a very important research project on flavor instability. By using our influence, I am sure that we secured reconsideration, and this project is going on. Agriculture must never allow any wholesale reduction of important basic research.

Your officers have endeavored to be alert to the needs of our individual members. A certain railroad company in the Delta area threatened to rescind a freight rate decrease, which gave a large group of growers a reduction of from 28 cents per hundredweight to 19 cents per hundredweight, to carry their soybeans to the Gulf. This came at the peak of their crop moving season. I was pleased to find that our Association has prestige, and, in the absence of the secretary, who was in Europe at the time, raised objections which may have helped head off the proposed increases. This subject has been under reconsideration since, and we are continuing to watch this situation.

The field of utilization of the soybean and soybean products, is the biggest field of activity we have. The American Soybean Association is not a business organization, and does not contemplate being one, but whatever we can do to encourage better and more efficient ways of handling our soybean crop, we shall be alert to do. I wish to pay a well deserved compliment to industry for the wonderful contribution it has made in the past 25 years in developing uses for the soybean. With the aid of research, both private and public, and the courage and far sightedness of many industries, both big and small, we have a broader market for our soybeans;



(Above) Camera catches Illinois' directors LeRoy Pike, Pontiac, Ill., and C. G. Simcox, Assumption, Ill., in front of the statue of Abe Lincoln on the state house grounds.

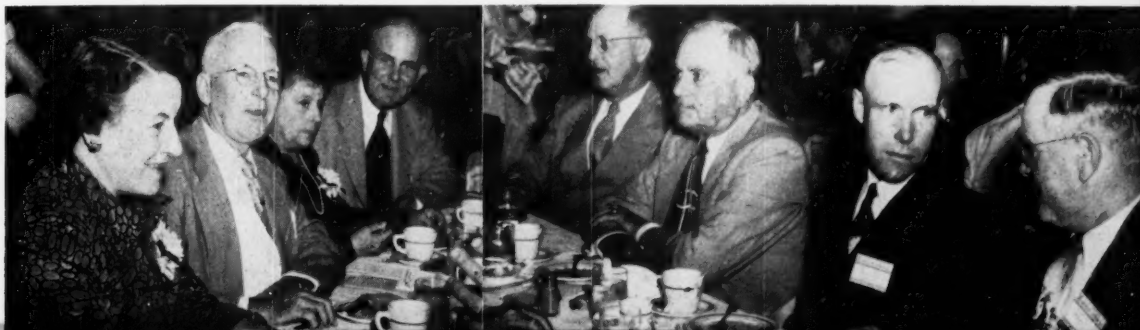


(Middle picture) Dr. R. E. Carlyle, agronomist for the Monsanto Chemical Corp., and H. I. Cohn, both of St. Louis, discuss chemical control of weeds at which Cohn has been working at Valley Farms, Inc.



(Bottom) U. S. Senator Scott W. Lucas and Toastmaster W. L. Burlison of the University of Illinois visit during the banquet.

(Left) Veteran soybeaners and their wives: Mrs. David G. Wing, Mechanicsburg, Ohio; Mr. and Mrs. Jacob Hartz, Sr., Stuttgart, Ark.; and David G. Wing. (Right) Purdue agronomist K. E. Beeson makes a serious comment to O. H. Acom, Wardell, Mo.; and R. H. Peck, River Canard, Ontario and Calvin Heilman, Kenton, Ohio, exchange views.





(Top) Louis Groh, Claybank, Va., seedman and exporter and Skelly Oil Co.'s "Doc" MacGee get acquainted.



(Center) John W. Evans, Montevideo, Minn., and J. W. Calland, Decatur, Ind., compare notes with Claude Lazard of Soya International Research and Development, France.



(Bottom) Four seedsmen examine a "Clipper Cleaner". Jake Hartz, Jr., Stuttgart, Ark.; C. H. Monteith, Farmers Coop. Exchange, Paragould, Ark.; LeRoy Pike, Pontiac, Ill.; and C. R. Acord, Kansas, Ill. Monteith bought the machine.

in fact, without the progress of industry, we would not have the market for soybeans we have now. The program which you are considering at this convention reveals the wide diversification in all phases of utilization of the soybean. New uses are being found every day as our scientists discover how to open the secrets held by nature. Industry has done much; our government has made great contributions, our educators and trade promoters have added their accomplishments. Here, a farmer from the North Star State of Minnesota, meeting on the same basis as the farmer from the Mississippi Delta area, along with the interest of the Canadian brother, and confined by the East and West limits of the great Mississippi Valley empire, are all paying homage to this small plant, introduced from the Orient scarcely 50 years ago. In the future, we predict greater utilization and greater understanding of the possibilities of this wonderful plant.

It has been a pleasure to work with my fellow officers of the Association. They are high class men with vision and determination. They represent all soybean producing areas. In the short 4 years that I have been a director and officer, I have been impressed with the splendid traditions of the Association, and I am deeply concerned that as long as I have any official connection with the American Soybean Association, I shall endeavor to see that the high hopes and standards promulgated by the early founders shall be maintained.—JOHN W. EVANS, MONTEVIDEO, MINN.

### Report of the Secretary-Treasurer

It was approximately 2 years ago that Ersel Walley coined the phrase "Soybeans Are Worth More Money". It became the title of a leaflet issued by the American Soybean Association, and then a year ago it was the theme of the

29th annual convention. During the past year it has become apparent that someone believed that story, agreed with it, and did something about it. Many times during recent months I have been reminded that we said "Soybeans Are Worth More Money", and asked how we had convinced America that it was true. Whether through foresight, genius, luck or beginners insight, the phrase, coined to do a specific job, has become a byword in the soybean industry.

Now we are faced with the largest soybean crop in history. Federal crop estimates place it in about 270 million bushels. My guess brings it to lower levels. In any event, we are going to have more soybeans than ever before. We will approach that 300 million bushel crop some of us talked about last fall. A crop the size of the expected 1950 production poses some very distinct problems. Some of them are being discussed on this convention program. Storage, shipping facilities, unloading and handling facilities—all are going to be overtaxed if we have normal harvest weather. These things serve to focus attention on what in my estimation is one of the major problems of the soybean industry.

That problem is the marketing pattern of the industry. During World War II soybean production increased tremendously. Acreage doubled and redoubled. Ceiling prices prevailed, there was no incentive to store any portion of the crop on the farm or at country points. During those years we built up a marketing system which is working against us now.

No crop which is storable can ever be marketed intelligently when it is marketed during one short period of the year. We have been marketing the major portion of the soybean crop in about 1 month's time. We drive prices downward, force a good portion of the crop to sell at sacrificial prices. Then we cry about it. The solution is a very simple one—and it is one which is going to be highly important this year. It is to hold at least

Women on tour stop in front of the tomb of Lincoln. They also visited New Salem State Park, Lincoln's home and the Pillsbury Mills, Inc., Premix plant.





(Left) S. F. Maxwell, Jr., of Weather Forecasts, Inc., explains his maps to Gus Lueschen, standing, and Mr. and Mrs. Gus Lueschen, Jr., all of Wisner, Nebr. The Lueschens grow 140 acres of soybeans in a county where few other beans are grown. (Right) In huddle between sessions are Wm. G. Eicher, American Cyanamid Co., Chicago; Errel Walley, Walley Agricultural Service, Fort Wayne, Ind.; C. M. Johnson, Allerton, Ill.; and J. E. Johnson, Champaign, Ill.

one-half the soybean crop on farms and at country shipping points, market it over the winter and spring months. The grower, the local buyer and the processor will all benefit if we will do so. Over a period of over 20 years there has been an average price increase, not counting the war years when ceiling prevailed, of about 25 cents per bushel between Nov. 1 and the following June 1. Certainly soybeans can be stored for that figure.

One of the major accomplishments of the American Soybean Association during the past year, in my estimation, was decided in the office of the Secretary of Agriculture. And in view of the Korean episode, how lucky that decision was! Five representatives of your association—members of the board of directors and the trade and use promotion committee, sat in Secretary Brannan's office for over an hour on Jan. 4 discussing the desirability of not placing acreage controls on 1950-crop soybeans. There had been much talk, and some action, toward soybean acreage controls, prompted by the fear that soybean acreage would go wild and we would find ourselves with a crop which could not be utilized. We apparently convinced the Secretary that there was no surplus of soybeans, that the United States had never had an opportunity to find out how many soybeans could be utilized, and that soybeans should be allowed to find their own levels of consumption both domestically and in foreign markets.

One of the key men in the grain branch of PMA privately told me we were crazy for recommending such a move. Acreage controls, in his estimation, were absolutely essential. The same man 3 weeks ago told me the department would be crazy to announce a support price on soybeans when they were selling at levels far above the anticipated support price. The situation changed. Cotton acreage was cut 30 percent. Demand for fats and oils increased. Price levels on both oil and meal are now all above those of last year at this time. The market places have recognized that "Soybeans Are Worth More Money".

It is my feeling that had our group not discussed this matter with the Secretary his aides would have convinced him acreage controls were necessary, and we would have ended up with totally inadequate supplies of both proteins and oils.

Another of the major accomplishments of the year was participation in the legislative activity which culminated in the removal of all federal taxes and restriction on the sale of yellow margarine. This market is the second most important of our oil markets, is becoming more important each month now that repeal has become effective. This victory came as a result of years of work. The American Soybean Association convention in Cedar Rapids, Iowa, in 1943 passed the first resolution endorsing the participation of the Association in margarine repeal activities. Each year since that date we have adopted similar resolutions. The road has been long—and uphill—but the combined forces won the battle. Now we have the job to finish—in 15 states.

And to go along with it, the American Soybean Association took a very important part in the Ohio referendum on margarine legislation. As a result of the activities of this Association, together with other participating groups, the voters decided by a majority of over three to two that they wanted taxfree yellow margarine.

For a period of years the Food and Drug Administration has had under consideration Standards of Identity on bread.

(Continued on page 83)

(Second from top) Glenn Fogeler, North Iowa Cooperative Processing Association, Manly, Iowa; and Dixon Jordan, Standard Commission Co., Memphis, Tenn., check market report of Merrill Lynch, Pierce, Fenner & Beane.

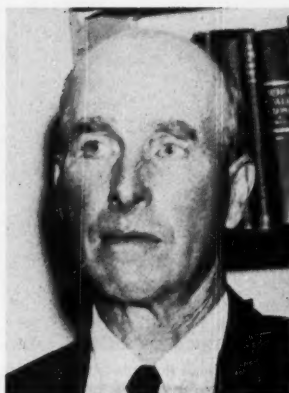
(Second from bottom) Harold A. Lumsden, Essex Grain Co., Essex, Mo., gets acquainted with Mr. and Mrs. M. N. Seeburger, St. Charles, Mo.

(Bottom) A. L. Ward of National Cottonseed Products Association compares notes with ASA officials Geo. M. Strayer at left and Chester Biddle. Biddle was elected vice president of the Association.





GEORGE HEARTSILL BANKS



TAYLOR FOUTS



EDWARD JEROME DIES

## HONORARY LIFE MEMBERS 1950

George Heartsill Banks, Wardell, Mo., Taylor Fouts, Camden, Ind., and Edward Jerome Dies, Washington, D. C., were chosen honorary life members of the American Soybean Association at its 30th convention in Springfield, bringing the total number of life members to 14.

It was a severe shock to the awards committee as well as to the soybean industry generally to learn of Mr. Bank's death in a Los Angeles hospital Aug. 10 after his nomination for a life award. He was held in highest regard by the entire industry. It was decided to let the award stand after his death.

Members of the awards committee were Jake Hartz, Jr., Stuttgart, Ark., chairman; O. H. Acom, Wardell, Mo.; and J. W. Calland, Decatur, Ind.

Awards were presented at the annual banquet.

Life members previously elected are: W. J. Morse, Washington, D. C.; W. L. Burlison, Urbana, Ill.; I. C. Bradley, Taylorville, Ill.; J. C. Hackleman, Urbana, Ill.; G. G. McIlroy, Irwin, Ohio; C. M. Woodworth, Urbana, Ill.; David G. Wing, Mechanicsburg, Ohio; J. B. Edmondson, Danville, Ind.; Keller E. Beeson, Lafayette, Ind.; Jacob Hartz, Sr., Stuttgart, Ark.; and E. F. Johnson, Delphos, Ohio.

### George Heartsill Banks

George Heartsill Banks, 57, was born at Raines, Tenn. He graduated with a bachelor of science degree from the University of Missouri in 1914.

He was director of field service for the Arkansas Cotton Growers Cooperative As-

sociation from 1921 to 1926 in Little Rock, Ark.

He was director in charge of the Rice Branch Experiment Station at Stuttgart, Ark., from 1926 to 1937. He was with Ralston Purina Co. at Osceola, Ark., and Kansas City, Mo., from 1937 to 1946.

While at Osceola Mr. Banks did the selection work on Ralsoy, which has become one of the most popular soybean varieties in the South.

In 1946 he went on a 2-year mission for the War Department in American-occupied Korea where he was in charge of rice experimentation and breeding.

In 1948 he became associated with the O. H. Acom Farms at Wardell, Mo., where he had charge of breeding work and seed production.

Again in January of this year Mr. Banks left on a mission to Asia for the United States government, this time as an aide to Stanley Andrews, director of the Office of Foreign Agricultural Relations of the U. S. Department of Agriculture. The trip was undertaken for the Army in connection with the food and agriculture program for Japan.

He arrived home ill and had been in poor health since. He died in a Los Angeles hospital Aug. 10.

He was a longtime member of the American Soybean Association. He attended its meetings most years and served faithfully on many committees.

### Taylor Fouts

Taylor Fouts of Camden, Ind., has been a farmer and seed producer in that state for 35 years. He was graduated from Purdue University with a bachelor of science degree in agriculture and was one of the first Master Farmers to be selected in Indiana.

Mr. Fouts has been one of the true soy-

bean pioneers. He remembers that his father first procured free soybean seed from the U. S. Department of Agriculture in 1896 or 1898. After his graduation from College he began growing soybeans in 1904.

Within a few years he was growing them extensively, in association with his brothers, Noah and Finis. They distributed seed of all the early grown varieties in the days when soybeans were grown for forage and for the seed.

Soybean days in cooperation with Purdue University were held in 1910 and 1916 at the Fouts farm, which became known as Soyland. These soybean meetings helped to create widespread interest in the crop. It was Fouts' intense enthusiasm that helped to attract to the crop many other leaders who became nationally known later.

And in 1920 a Cornbelt soybean conference was held at Soyland. At this conference the National Soybean Growers Association was formed. Later the name was changed to the American Soybean Association.

Fouts was elected president at this meeting, and so became first president of the American Soybean Association. He was elected president of the Association again in 1928.

### Edward Jerome Dies

Edward Jerome Dies headed the soybean processing industry in the critical period of development and promotion, a period when products had to fight every inch of the way into a fiercely competitive field.

Born and reared on the West Coast, he studied finance and economics and then entered journalism. He was a staff correspondent of the Associated Press and a magazine writer before launching his Chicago public relations bureau.

In 1936, when the soybean crop was only

(Continued on page 81)

SOYBEAN DIGEST



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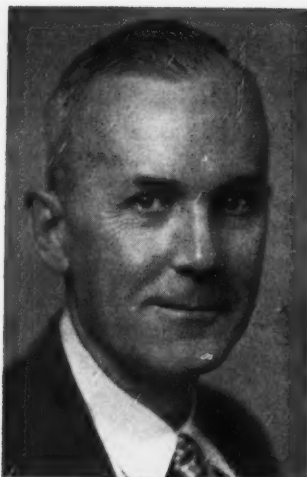
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FRED J. ROSSITER

## WORLD TRADE

# American Agricultural Commodities in World Trade

By FRED J. ROSSITER

Associate Director of Foreign Agricultural Relations, U. S. Department of Agriculture

changes which have occurred in the international agricultural trade during the past 10 years.

Let's begin with Asia—which promises to remain a focal point of world interest during the next few years.

The key to Asia is rice, and the key to rice is a small little area of the world's surface made up of three countries—Burma, Thailand (Siam), and French Indochina. That's the world's "rice bowl," which normally produces two-thirds of the rice moving in international trade. Most of the countries around are rice-deficit areas. A decade ago, this rice bowl furnished 6 million tons of rice a year to such deficit countries as India, Ceylon, Malaya, and China. When you see on the map that Communist China joins this rice bowl on the north, you can understand immediately the importance of that area in the cold war. Controlling that area means to Asia about what foreign military control of the Midwest here would mean to the rest of the United States.

### Korea, Formosa

Korea and Formosa were also pre-war exporters of rice. Their rice went to Japan. However, before the war Asia also shipped rice to non-Oriental areas. Two million tons went to Western Europe, Africa, and the Western Hemisphere annually.

In addition to rice, Asia was a net exporter of sugar before the war. Most of it went to the United States.

Asia's soybean and soybean oil exports before the war are well known to you. Likewise their shipments of peanuts and copra. Most of the soybeans and peanuts went to Western Europe.

But Asia also had important food imports, of which wheat and flour were the largest.

In balancing food exports and imports, Asia, before the war, had a net export of nearly 5 million short tons of food annually. That may be surprising to some of you in view of the widespread hunger normally attributed to that area.

What has happened since the war? Large parts of the area have been torn by unrest, ranging into outright hostilities. Sometimes we fail to realize how much warfare and near-warfare have been going on throughout this area since the so-called end of World War II.

Last year, Asiatic surplus areas only exported about a third as much rice as pre-war. And none of this left the Orient. Thailand is the only one approaching pre-war exports. Formosan rice production is back to prewar, but most of it is being consumed by the increased population. Last year, South Korea finally got its rice production back to about prewar, and this year it had its first surplus since its liberation from Japan. But it doesn't look as though much Korean rice will get into world trade soon. The net result on rice is that Asia now imports a half million tons a year, rather than the 2 million tons it exported prewar. These imports were from the United States, Egypt, and Brazil.

With other commodities the picture is the same slow recovery. Confusion in Manchuria has practically cut off the flow of soybeans from that area. Asia's peanut exports are only one-fifth prewar and sugar exports only one-half. Before the war the Orient furnished soybeans and peanuts to Germany, France, The Netherlands, Belgium, Italy and the United Kingdom to the extent of about 3 million tons annually. Now the movement is less than one-tenth that amount—about 200 to 250 thousand tons annually. On the other hand, Asia's food imports are hitting record heights.

Now let me pull together this picture in Asia. Before the war, remember Asia had a net food export of about 5 million short tons. Last year that area had a net food import of 8 million. That made a total difference of 13 millions tons of food in world trade that had to come from somewhere. Most of it came from the United States, Canada, and Australia. Of the three, we supplied the largest quantity. That accounts for a large part of the great increase in our exports which I mentioned at the beginning.

Future developments in this Asiatic situation depend on the speed with which peace and economic stability can be restored. Normal rice shipments will not come out of Burma as long as it has to be brought down the Irrawadi River under armed guard. It is also important to remember that most of this area has become independent of colonial rule in the past decade.

India, Pakistan, the Philippines, Korea, Indonesia, and Burma have all become independent. This awakened nationalism has

IT'S DIFFICULT to discuss the world trade situation at any time, but particularly in these confused days when any minute the Korean conflict could suddenly engulf the entire world. In planning ahead in our agricultural program, we are attempting to get ready for any eventuality.

But for the purposes of this discussion I will assume that the Korean fight will remain localized, but that the cold war will remain intense for quite some time.

Now under those assumptions, what does the world trade picture look like, and what impact does it have upon United States agriculture?

With a United States soybean crop estimated at 270 million bushels (67 times what it was in 1920), and with United States exports for the 2 past marketing years averaging 50 million bushels per year, one can easily realize why your program committee believes you are now very much interested in the foreign market situation.

Soybeans are not the only item we have been shipping abroad in record volume in recent years. During the past 4 years, our wheat exports have been 1,700 million bushels, corn 300 million bushels, and soybeans (including oil in terms of beans) 135 million bushels. I know figures don't mean too much, but those are rather impressive. That 135 million bushels of soybeans exported in 4 years, for example, means a bushel for nearly every man, woman, and child in the United States.

For many of our crops, exports have taken from 20 to 40 percent of our total production. The value of those exports was equal to between 10 and 15 percent of our total cash farm income.

What created this enormous export demand following World War II? Does this demand still exist? Can we expect our exports to continue at the current level? I cannot give you the answers, but possibly I can furnish you with some information which will help you to reach your own conclusions.

We need, first, to examine some of the

made the people more restless, more demanding. Insistence on an improved standard of living is growing. Furthermore, there has been a tremendous growth in population in most Asiatic countries since the war, equal, in total, to the entire population of the United States.

Japan creates a special problem for us since it has been stripped of its colonies, has lost its markets for its industrial goods, and has a population increase of between 15 to 20 percent. At the present time the United States taxpayer is bridging the gap.

India is another great deficit food area having an increased population and decreased rice imports from Burma and Thailand, as well as a decrease in the supplies of wheat and millet from Pakistan.

## Europe

Now let us turn to Europe to see what changes have taken place in the movement of agricultural commodities in that area at the present time, compared with a decade ago. In Europe we find that the surplus agricultural areas are primarily located behind the Iron Curtain. In 1938, the last complete year before World War II, the countries that are now behind the Iron Curtain shipped to Western Europe about 5½ million tons of wheat, rye, corn, barley, and sugar. The Soviet Union usually had a surplus of wheat and rye. The Balkan countries normally exported wheat, rye, corn and barley. Czechoslovakia and Poland normally had a surplus of sugar and Eastern Germany annually shipped about 1 million tons of breadgrains to Western Germany.

Though this movement almost completely dried up immediately after the war, some of it has since been resumed. In 1949 approximately 2½ million tons primarily of wheat and corn were delivered to the Western European countries. Therefore, for the European countries in which we are particularly interested, we find that they have approximately 3 million tons less food and feed available from Eastern Europe than before the war.

If we summarize the changed situation in Asia and Europe, we find an urgent need for about 16 million tons more food than in prewar. This increase is equivalent to about 530 million bushels of wheat.

One of the reasons why a greater demand has been put upon the United States and Canada to supply this increase is due to the reduced supplies that have been available from Argentina in the recent years. Argentina, up to World War II, was supplying Western Europe with approximately 10 million tons of cereals annually, while at the present time shipments are amounting to only 4 to 5 million tons. The conclusion that can be drawn from the analysis thus far is that there still exists a tremendous demand in Asia and Europe for our agricultural commodities.

The next question that arises is whether these countries can pay us for the large agricultural exports which we can furnish.

This problem we now call the "dollar gap." United States total exports of agricultural and industrial items during the past 4 years came close to 50 billion dollars. That's just about double our imports during that period. A gap of about 23 billion

dollars existed. How was this gap filled? About two-thirds was filled by ECA aid, UNRRA shipments, and Army procurement for occupied areas. The remaining third came from the foreign countries digging into their reserve to pay for the needed imports from the United States. Most countries have now reached the place where they refuse to dip any deeper into their reserve funds and, therefore, are restricting imports from the United States.

In the light of this situation, it is not difficult to understand why foreign governments control the use of their limited dollars. This "dollar control" brings up some tough decisions for these governments. They need our food. But they also need our industrial commodities, many of which are not available in any other part of the world.

Up to World War II, Germany and Japan supplied other countries with a large variety of industrial goods. Now their exports are a mere trickle of former years. Their old customers find that now they must turn largely to this country. Therefore, these European countries and others either try to obtain their needed agricultural imports from some other area or subsidize their own farmers in an effort to become self-sufficient in food. Such action, of course, works to the detriment of United States agriculture.

As never before, our standard of living is dependent on international trade. The more international trade we can develop and maintain on a sound basis, the more ocean shipping that will be required, the larger the number of dock workers that will be needed, the more rail transportation that will be necessary—and there will be additional work for many people all along the line. It not only will result in greater employment in this country, but also in the countries with whom we trade. If the United States can help increase international trade on a sound basis, it will mean that other countries will have higher standards of living, more employment, and thus a greater demand for agricultural commodities.

Bringing the problem back to oilseeds, we

all know that a large demand exists in Western Europe. It appears it will be some time before Manchurian soybeans and peanuts from India, China and Manchuria will be available in the prewar volume. The European countries have become fond of American soybeans, but will they buy from us all that we can supply? Many of them must use their limited dollars for necessary industrial items and for cotton, wheat, lard, and tobacco. How many dollars each European country will have available for soybeans will depend to some extent on the amount of goods we buy from them.

The problem then, with which we are faced, is how we, in the United States, can help other countries earn more dollars in order that we may be able to sell them more of our commodities.

You are familiar with the government's efforts in this connection.

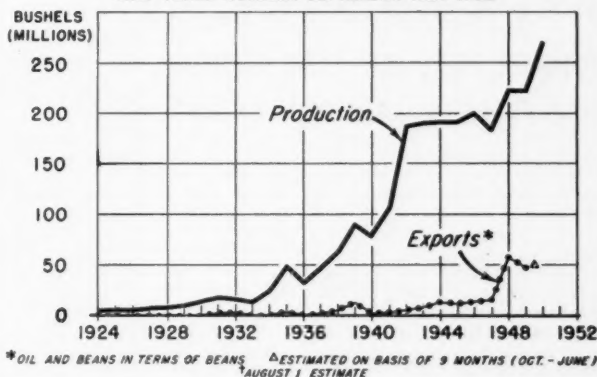
European recovery is now an accomplished fact in terms of physical production, and much of the credit goes to ECA. Last year Western Europe's agricultural production was back to prewar and industrial production is now about 25 percent above prewar. They still aren't able to close the dollar gap at the present level of imports, but they have made a lot of progress.

It should be remembered that the European Recovery Program has been of great help to Asia also. Our help to England has allowed that country to pay off war debts to India and other Asiatic countries. These funds have been absolute life-savers in the recovery of some of the Asiatic countries and in helping the new governments over the first years of their independence. ECA and the Army have also helped directly in Japan, Korea, and Formosa.

So the European Recovery Program and the other aid programs that preceded it—UNRRA, British Loan, Greek-Turkish Aid—have been important in our efforts to build a high-level postwar world trade.

A second major step has been our efforts to reduce tariffs and other barriers to trade. This may not be spectacular, but it is extremely important. And it involves a great

## U.S. SOYBEAN PRODUCTION AND EXPORTS CROP YEARS OCTOBER-SEPTEMBER 1924-1950<sup>1</sup>



U. S. DEPARTMENT OF AGRICULTURE

OFFICE OF FOREIGN AGRICULTURAL RELATIONS

deal of hard work and widespread public understanding. Our job is to get tariffs down wherever practical and at the same time see that no United States industry or commodity is really injured. There were tariff reduction meetings in 1947 and 1949. Now we are preparing for a third round which will get under way in England during September.

A new development which will have an important long-range effect on our foreign trade is the so-called "Point IV Program"—technical assistance for underdeveloped areas. By the time the Soybean Association has put another 30 years under its belt that program may have made a world of difference in the foreign trade picture.

I can speak with some assurance about what can be accomplished with this type of work since the Department of Agriculture has been doing it, on a limited scale, for 10 years in Latin America. There are six agricultural stations in Central and South America which are operated jointly by our government and the governments of countries in which they are located. We put in about 1 dollar to their 3. Our scientists go down there and work shoulder-to-shoulder with theirs on projects of mutual interest.

These stations have concentrated on things the United States needs to import—coffee, cocoa, rubber, hard fibers, insecticides such as rotenone, and quinine and other medicinal crops which are essential to our civilization. The results are already being felt on a small scale in higher production in these countries, with higher exports to the United States, which of course means more United States machinery and agricultural products going down there. Equally, if not more important, we are developing sources of supply here in the *Western Hemisphere* of items which we normally get from more distant parts of the world. In case of war, that can be of tremendous value. I repeat that this is only a small beginning, which we don't want to overplay. But it is a going example of what agricultural cooperation with other countries can accomplish on a much wider scale.

Sometimes we hear the question asked, why should we teach these countries to grow more food—that it will only reduce the amount of agricultural commodities that they will buy from us. In reply, we have plenty of evidence if these countries do not have the buying power, how can they buy our products. We believe the higher the standard of living that can be developed in foreign countries, the more they will purchase from us. Take the example of Canada. Last year, Canada purchased nearly 1,900 million dollars worth of goods from the United States, while we bought over 1,500 million dollars from Canada.

Increasing foreign travel is another important factor in closing the dollar gap. Here again farm groups are taking an important place. There has been a steady stream of farmers going to Europe in the last few years to see for themselves what is going on over there. Their reports back to the home folks have been a powerful force in strengthening the hand of our government in carrying out the European Recovery Program.

# AMERICAN FARMERS *and the Future of* THE FREE WORLD

By  
**SENATOR SCOTT W. LUCAS**  
Majority Leader, U. S. Senate

**W**HEN I RECEIVED your invitation to speak at this annual banquet, I accepted with a great deal of pleasure because I remembered the very pleasant experience I enjoyed several years ago when I spoke at the soybean festival in Taylorville. I am a soybean grower myself, and I always feel at home with people who realize the value and the tremendous importance of the soybean industry in the world of today.

As we all know, we are now engaged in a severe struggle with the forces of communism throughout the world. In Korea, the struggle has become a military conflict and young American soldiers, sailors and airmen have been called upon to fight over there for the safety and security of the United States and the free world. At Lake Success, in the meetings of the United Nations Security Council, the struggle is a battle of wits by our diplomatic representatives and those of the Soviet Union. In other parts of the earth, the struggle is an endless contest for the loyalty of mankind.

All of us share the risks and the rewards of this struggle which may determine the future of our civilization. The risks are very great, because we face opponents who are fanatical, insidious, tireless and utterly ruthless. Yet the rewards are also very great—America has the reward of knowing that America stands in the vanguard of freedom, America holds the leadership of all men who are devoted to liberty and justice.

Our opponents have one great advantage in this struggle—masses of military manpower, trained and hardened for combat. But we have an advantage which overrides theirs in the final analysis—the gigantic productive power of our farms and factories which cannot be equalled by any other nation on earth. And greater than all of these—is our spiritual concept of life which is unknown in the communist world.

Yes, we have many atomic bombs and other weapons which can inflict terrible devastation if we are ever compelled to use them. We have invested our defense

billions more wisely than our critics realize. We have invested billions in research and in strategic weapons which have prevented the outbreak of any large-scale war. We are not using these weapons in Korea, because there is no necessity to use them in a military operation against the puppet forces in North Korea. But if aggression on a wide scale should occur, you can be sure that the United States of America is prepared to strike terrific blows in defense of civilization.

But all these weapons, all these devices could never have been created if we had not developed here in America the scientific knowledge, the natural resources, and the manufacturing capacity to produce these things. And among the producers of America, the farmers are making the most rapid strides. Farmers have made the greatest gain of any group of our population in recent years, through the Federal Farm Program, through the application of science to agricultural production, and through the wiser use of our fertile land.

## Soybeans Essential

When we consider the vital products of our farms, soybeans must rank very high in the list of essential crops. During the second World War, soybean producers were asked to grow at least 9 million acres for harvest as beans in 1942—10 million acres if possible—as compared with 6 million acres harvested in 1941 before Pearl Harbor. And the soybean producers responded in a magnificent way, enabling the United States and the United Nations to make up for the billions pounds of fats and oils which were cut off by the war in the Far East.

In the years since we attained victory over the Axis powers, the soybean producers of America have done a great deal to overcome the world shortage of fats and oils. The food and agriculture organization of the United Nations declared in a recent commodity report: "The major improvement in world supplies . . . has come in the past 2 years from the United States of America where both the 1949 production and the 1950 estimated production are 1.8 million tons above the 1937-41 level, and 2.2 million tons above the 1935-39 level. This increase in production was planned in response to the acute world shortage in fats. It was achieved through



SCOTT W. LUCAS

the use of price supports on all the major commodities." This report from the United Nations makes it very clear that the people of the world are well aware of the tremendous expansion of American agriculture under the farm program we have developed in recent years.

The present emergency has proved once again the value of a flexible system of price supports. Through this system we have encouraged farmers to produce tremendous quantities of the foods we need. In some cases there has been overproduction, and the government has been forced to acquire large stocks of surplus commodities. Yet we can be thankful that our farm program has worked as well as it has in a time of crisis.

No one can deny that American farmers did not receive their fair share of the relative prosperity we enjoyed in the 1920's. The prices of manufactured goods went up, but farmers did not receive high

enough prices for their products to enable them to buy all the goods they wanted. The decline in farm purchasing power was one of the basic causes of the depression which began late in 1929 and reached terrible depths of suffering in 1932. Many farmers sank into poverty in those bitter years. Many lost their farms and were forced to search hopelessly for work in the cities.

When I first came to Congress in 1935 as a member of the House of Representatives, the necessity for a new farm program had become overwhelmingly evident. It was my good fortune to be chosen as a spokesman for 50 Congressmen from Midwestern farm states. My proposal for mandatory loans on corn crops became one of the basic elements for our farm legislation.

As I look back at the development of our farm program, it seems evident to me that we have made great progress in the last 2 decades. One of the most important phases of our program is soil conservation. I believe that our efforts in this field before the outbreak of World War II helped to make it possible for us to grow the gigantic crops which fed our armies and the people of the nations allied with us.

The Department of Agriculture reports that soil conservation practices have resulted in an increase of nearly 30 percent in the annual average yield per acre of all major crops grown on Illinois farms. This means that money spent on conservation has paid tremendous dividends to the farmers of this state and other states in the Union. It is easy to prove the practical value of soil conservation.

But the long-term effects are even more important. The 10 inches of top soil on which the food of the whole country depends certainly are our most precious possession. Unless we restore to the soil what we take out of it in food, we are mining the land instead of cultivating it.

The whole country has an immediate and a long-term interest in making sure that soil conservation practices are followed by every farmer whose soil requires such practices. We have made great strides in this program, but we must not falter in our efforts. This long-range program for American farms should not be considered as a partisan program. It is and must be free from all political considerations. It must be an American program.

### Strange Things

Many strange things occurred in 1947 and 1948, in the years when the 80th Congress sat in Washington. You may remember that the House of Representatives in that Congress removed the appropriation for soybean statistics from the general agricultural appropriation for the fiscal year 1947. The Bureau of Agricultural Economics had gathered soybean information for a long time, covering such important items as stocks on farms, stocks in interior mills and elevators, stocks in processing plants, and annual estimates of acreage and production by counties in the principal growing regions.

The cost of this fact-gathering operation, which was extremely useful to the soybean industry, totaled about \$20,000 a year. The budget request was included in the Bureau of Agriculture Economics estimates for crop and livestock reports. However, the House deleted the item entirely.

This happened at a time when there was a great shortage of fats, oils and protein. As we all know, soybeans are rich sources of oil and protein when such products were in short supply. With the aid of Senator Russell of Georgia, who was the ranking minority member of the Senate subcommittee on the Agriculture Appropriations Committee, I succeeded in having these funds restored to the final appropriation. Perhaps some of you here tonight remember that incident. I know that I received a number of letters from leaders of the soybean industry, express-

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ing their appreciation for the Senate's action.

Early this year, I agreed with Senator William Fulbright of Arkansas, on the desirability of passing a bill to repeal the federal taxes on the sales and manufacture of margarine. Some of my friends in the dairy industry here in Illinois and some Senators from dairy states were not exactly eager for the passage of this legislation. We had an exhaustive debate on the comparative merits of oleo and butter. The butter people seemed to feel that it would be very difficult to compete against the lower-priced margarine. It seemed to me, however, that there would be large markets for butter and margarine, and that the two products should be placed in free competition without the intervention of federal taxes which would hamper margarine.

The margarine bill became a public law on Mar. 16, and became effective a little over a month ago. Thus far, I do not believe there have been any disastrous effects in the dairy industry and I think that the producers of soybeans are finding a larger demand for soybean oils and proteins as a result of this measure.

In the troubled world of today, when the production of food is a vital factor in the struggle against communism, I believe that we should encourage the growth and marketing of all nutritious crops. American farmers hold the keys to the future of the world in their hands. The

miracles of American agriculture have given the American people the most satisfactory food supply of any nation on earth. American farmers have enabled our government to feed millions of troops and many millions of civilians in allied countries during two tremendous wars.

In the last 2 years we have shipped huge quantities of soybeans and other American products to the people of Western Europe under the Marshall Plan. There are faint-hearted men in Illinois and other states of our country who are going about the land, shouting against the Marshall Plan and branding our bi-partisan foreign policy as a costly and ineffectual program. I think the record of history proves that such men display an appalling lack of foresight and wisdom.

I am utterly confident that the historians of the future will look upon the Marshall Plan as one of the most magnificent achievements in the long story of mankind's rise from the darkness of barbarian isolationism to the broad light of civilization. I believe the historians will agree with Senator George Aiken of Vermont, one of the wise Republicans who have joined Democratic leaders in creating an American foreign policy to keep America in the forefront of the free world. Senator Aiken said recently on the floor of the Senate: "We have proved conclusively that it is cheaper for us to maintain strong economies in countries of Western Europe than it is to have another Korea all over Western Europe. The 10 billion dollars

we have spent there has not been money thrown down the drain. It not only has added greatly to our national security, but a large part of it has been returned to us in the form of increased business. . . Let us carry out our program for the recovery of Western Europe as we have planned it, because by so doing we shall achieve a greater security, as well as an actual saving in expenses over the long-run."

In 1950 we stand at a crucial point in history. In this year of communist aggression, we must go through the storm and stress of an election campaign. We may differ with one another on all domestic issues without placing the future of America in any danger, but we cannot drag our foreign policy through a hurricane of partisan fury unless we are willing to risk the security and independence of this nation for purely political purposes.

The days to come will be full of peril for all of us. If we rise to the heights of true citizenship, if we overcome our partisan differences in one vital field—the field of foreign policy—we will come through this tragic year with the invincible strength of a great nation aroused and united behind the flag of liberty. To be worthy of our heritage, we must march forward together at the call of our Commander-in-Chief. We must have faith in him and in ourselves. If we keep that faith strong in our hearts, we will beat back the bloody fists of communism which pound upon the gates of our civilization.

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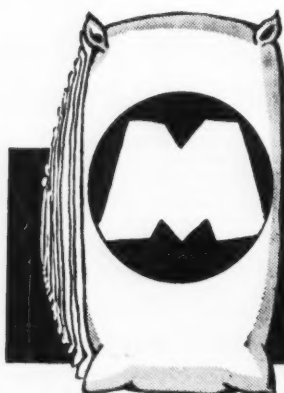
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L. K. ARNOLD

**S**OYBEAN PROTEIN in varying degrees of purity has had considerable utilization for adhesive and related uses. For example, modified solvent extracted soybean oil meal is used widely as a glue for plywood, and technical soybean protein (about 97 percent protein) is used in adhesives, paper sizing, water-thinned paints, leather finishes, floor covering, and fire fighting foam.

A water-soluble product called "Gelsoy" composed of both proteins and carbohydrates has been produced by the Northern Regional Research Laboratory by the water extraction of ethyl alcohol-extracted soybean oil meal (2). A 10-percent water solution of this product, when heated at 90° C. for a minute, formed an irreversible gel which, though not as strong and clear as gelatine, was self supporting. It was shown to have possibilities as an egg-white substitute in products such as meringue and certain confections. It was also suitable as an adhesive. It was first believed that it could be made only from alcohol-extracted and not from hexane-extracted soybean oil meal. More recent work has shown that hexane-extracted meal may be used if first given an alcohol wash to remove a waxy material which apparently interferes with the gelling.

Extensive research in the Iowa Engineering Experiment Station (1), (3), (4) has resulted in the development of a continuous process and the establishment of plants for the extraction of soybean oil by trichloroethylene. Inasmuch as the work with "Gelsoy" indicated that there is a wide difference in the gelling properties of a water extract from hexane- and alcohol-extracted soybean oil meal it seemed desirable to determine the gelling characteristics of a similar water extract of trichloroethylene-extracted meal. Since water soluble proteins are coagulated by heat and since it is necessary in any solvent process to remove the solvent by heating, it seemed desirable to first determine the effect of heat on the extracted meal.

As a first step in this determination

## RESEARCH

# GELLING PROPERTIES OF A WATER EXTRACT OF TRICHLOROETHYLENE-EXTRACTED SOYBEAN OIL MEAL

By L. K. ARNOLD

Professor of Chemical Engineering, and

S. L. CHEN

Formerly Graduate Student, Iowa State College, Ames, Iowa

flaked soybeans were extracted by trichloroethylene in the laboratory at room temperature to remove the oil. The batch of extracted flakes was then divided into six parts, each of which was dried in a constant temperature oven at a different temperature for 24 hours, the temperatures ranging from 50° to 170° C. The amount of water soluble material in each sample of extracted meal was determined as follows:

The dried extracted flakes were finely ground in a mortar and 0.4 grams of the finely ground meal were weighed in a test tube having a tin foil-coated stopper. Eight milliliters of distilled water (20 times the weight of the meal) were added, and the tube stoppered. It was then shaken intermittently for 15 minutes and allowed to stand with frequent shaking for 3 hours. The mixture of water and meal was then centrifuged for 5 minutes separating the liquid as a clear solution above

the extracted meal. This clear solution was transferred from the tube into a weighing bottle and weighed. It was then dried to constant weight at 60° C. and the percentage of water soluble material calculated. The insoluble residue in the tube was also dried and weighed as a check.

The protein content of the water-soluble product was determined by the Kjeldahl method using selenium oxychloride as a catalyst. The results of these determinations are given in Table I and shown graphically in Figure 1.

As would be expected the amount of both the total solubles and protein extracted by water decreased with an increase in temperature. Although no extractions were made on meal dried below 50° C., the flatness of the curve between 50° C. and 70° C. indicates little advantage would be gained by going lower.

While it would be desirable from the

Figure 1. Variation of total water soluble and soluble protein in trichloroethylene-extracted soybean oil meal with drying temperature.

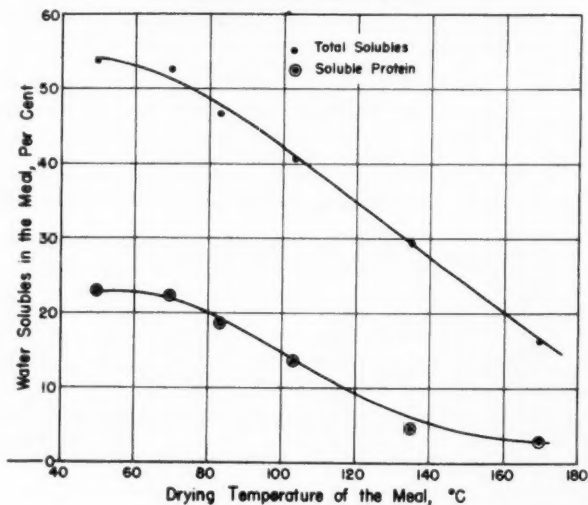


Table 1. Effect of Drying Temperature on the Amount of Water Soluble Material in Soybean Oil Meal

Drying Temperature, °C.	Percent of Soluble Protein		
	Total Solubles Percent	in the Solubles	in the Meal
50	53.97	42.4	22.9
70	52.57	41.5	22.4
83	46.71	38.9	18.6
103	40.84	33.6	13.6
135	29.16	15.3	4.5
147	—	12.9	3.1
170	16.35	18.1	2.9

standpoint of economical solvent removal to dry at a higher temperature, 80° C. is suggested as a good compromise drying temperature. This would allow approximately 50 percent soluble material to be extracted while drying within seven degrees of the boiling point of the solvent. Since the experimental results are based on a 24-hour drying period which is many times that used commercially, and since the coagulating effect of heat is probably partially dependent upon the time of application of the heat, it is probable that in practical operation the meal could be dried at a higher temperature than 80° C. without decreasing the soluble material below 50 percent.

To determine the optimum flake-water ratio for the efficient batch extraction of the meal, trichloroethylene-extracted soybean flakes dried at 50° C. were extracted with water by the following procedure:

Fifteen grams of the flakes were stirred with a measured amount of distilled water for 2 hours at room temperature. They were then centrifuged in a basket type centrifuge and the solid residue dried 24 hours at 80° C. and weighed.

The percentages of water soluble substance were then calculated and tabulated in Table 2 and presented graphically in Figure 2. These data indicate a water-flake ratio of 30 to 1 to be optimum. The optimum using this ratio was then determined by a similar procedure in which time was the variable.

The results (Table 3) indicate that there is not much advantage in single batch extraction of more than 2 hours.

A single water extraction of the extract-

Table 2. Effect of Water-flake Ratio on the Amount of Solubles

Extracted from Soybean Meal Time of digestion—two hours		
Grams of Water per Gram of Meal	Concentration of Solution in Percent	Solubles Extracted Percent of Meal
6	5.5	29.0
10	4.0	40.9
15	2.8	43.5
20	2.1	42.5
25	1.7	42.1
30	1.5	44.6
50	0.9	44.0
70	0.6	44.6
90	0.5	44.3

Table 3. Effect of Extraction Time on Amount of Solubles Extracted by Water from Soybean Meal

Time in Hours	Water-flake ratio—30 to 1 Solubles Extracted Percent of Meal	
	1	2
1	38.7	—
2	42.5	—
3	43.4	—
4	44.0	—
5	43.4	—
6	44.0	—

ed flakes using the 30 to 1 water-flake ratio produces a solution containing only about 1.5 percent solids, which is too diluted for economical drying industrially. Better extraction would probably have been secured if the flakes had been powdered before extraction. In commercial operation, however, powdered meal would be more difficult to extract than the flakes, due to problems involved in separating the powder from the solution. It is believed that the practical solution to this problem will be to use either a batch or continuous counter-current method which should produce solutions sufficiently concentrated to be evaporated by spray drying.

It was found that the heat coagulation of the water-soluble proteins and carbohydrates in the water extract resulted in a self supporting gel. Although the temperature at which the gelatin occurred varied with the concentration of solids in the solution, it was difficult to determine accurately the gelatin temperature directly by observation. Since, however, gelatin occurs when the viscosity expressed

Table 4. Viscosity of Solution of the Water Extract

Temp. °C.	Relative Viscosity in Seconds+ Trichloroethylene-Extracted Meal					Alcohol Extracted Meal
	10% solids	20% solids	27% solids	10% solids	20% solids	
15	11.5	21.5	21.3	10.6	16.7	—
50	—	—	21.8	—	—	—
70	11.5	—	22.0	10.6	16.9	—
79	11.9	21.6	27.2	—	17.1	—
75	12.1	24.4	—	10.7	18.1	—
80	12.6	31.2	87.7	10.6	18.9	—
85	13.0	75.1	—	10.8	21.4	—
87	—	Gelled	—	—	—	—
90	17.4	—	Gelled	11.7	39.7	—
93	—	—	—	—	55.9	—
95	594.3	—	—	15.5	—	—
98	—	—	—	26.6	Gelled	—

+ Temperature to which solution was heated prior to viscosity determination; viscosity was determined at 15° C.  
+ 100 seconds is approximately equal to 295 centipoises.

Table 5. Comparative Gelling Characteristics of the Water Extracts of Different Concentrations

Meal	Percent Solids in Solution	Gelling Temperature, °C.	Nature of Gel
Trichloroethylene extracted	10	94-96	Semi-solid
Trichloroethylene extracted	20	85-87	Good
Trichloroethylene extracted	27	82	Very good
Alcohol extracted	10	97-98	Semi-solid
Alcohol extracted	20	94-96	Fairly good

in terms of time becomes infinity, viscosity determinations were made on several concentrations of the water extract at various temperatures.

The viscosimeter used consisted of a glass tube 5 millimeters in diameter by 40 centimeters long and drawn out at the bottom end to a diameter of about one-half millimeter. Two points were marked on the uniform diameter of the tube 9.2 centimeters apart. The solution was heated to the desired temperature in a test tube in a water bath for ten minutes and then cooled to 15° C. It was then sucked into the viscosimeter tube, and the time required for it to flow between the marks with the tube in a vertical position was determined. Tests with several liquids of known viscosity indicated that a relative viscosity, as determined with this tube, of 100 seconds corresponds to about 295 centipoises.

For comparative purposes the viscosi-  
(Continued on page 82)

Figure 2. Effect of water-flake ratio on the amount of solubles extracted from soybean oil meal.

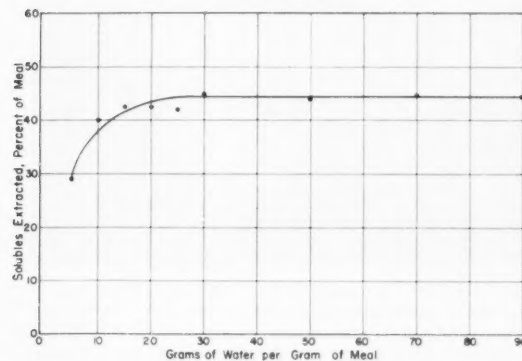
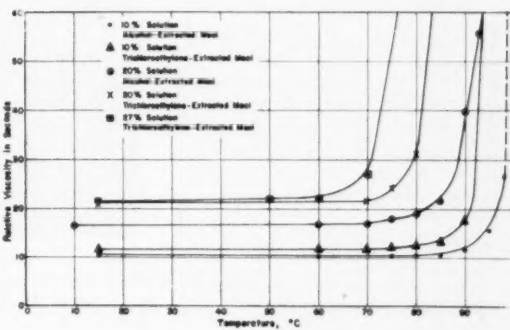


Figure 3. Temperature-viscosity relations for water extract.



# Recent Progress in Soybean Research at Northern Regional Research Laboratory

By R. T. MILNER

Director Northern Regional  
Research Laboratory\*

OUR MAJOR efforts during the past year has been devoted to the problem of flavor stability in soybean oil. I shall sketch our progress in this field, discuss the closely related work on lecithin and, finally tell you of our preliminary studies with soy flour. I should point out that expanded work on flavor and phosphatides, as well as initiation of the soy flour work, has been made possible by Research and Marketing Act funds. Those funds were established by Congress as a result of the support which your Association and others have given toward advancing agricultural progress.

Last year, Dr. Cowan, head of our oil and protein division, told you of our success in establishing a research taste panel and the way we check this group. This taste panel remains a most indispensable part of our program. Our confidence in the value of the statistical methods and panel procedures has been strengthened by the establishment of many industrial taste panels modelled after ours. A conference on taste panel procedures was held at the Northern Laboratory in December 1949. By request of the conferees, we are now sending out check oil samples for taste evaluation by a number of interested groups. The results are made available to the participants and offer a check and means for comparison in this difficult field.

After the harmful effects of iron and copper on the flavor of soybean oil were discovered, it was desirable to determine the exact amounts of these metals present. The determination of these metals in ores or inorganic salts is relatively easy, but to find whether there is one part or two parts in 10 million parts of oil, presented a difficult problem. An improved ashing procedure for oil has been developed which avoids loss or gain in these metals and permits spectroscopic analysis of the ash. With this procedure on a 20 gram sample, as little as 0.01 parts of iron and 0.001 parts of copper in a million parts of oil may be determined. This work was presented before the American Oil Chemists' Society in May and will be published in a forthcoming issue of the Journal of that Society.

Using this analysis for metals, it was

found that in the commercial separation of oil from beans, substantial iron contamination occurs. This is largely removed by the alkali refining operation. The last stage in preparing an edible oil, however, is usually deodorization and, since most deodorizers are made of steel, iron usually is introduced in amounts above the 0.1 part per million which affects flavor stability. The use of citric acid as a metal deactivator, or scavenger, during deodorization effectively prevents the catalytic action of the iron. In making this study of iron content on several samples of commercially-treated oils, it was evident that products from laboratory practice are not, in general always comparable to those from commercial deodorizing processes. The results obtained in this phase of the study indicate that better use of present commercial equipment, in addition to the increasing use of metal deactivators, will improve the quality of soybean oil on the market.

Important as the absence of trace metals may be for flavor stability of soybean oil, there are also other factors. After discovering the importance of iron, we tried adding iron to cottonseed oil and found little or no effect on its flavor. This directed attention to linolenic acid, the highly unsaturated acid found in the glycerides of soybean oil but absent from

cottonseed oil. Many others have attributed blame for off-flavors in soybean oil to the presence of this acid, but proof has been difficult to obtain. During this past year we have obtained rather conclusive evidence that linolenic acid does play an important part in the problem. Cottonseed oil, which contains no linolenic acid, was treated at low temperatures with the methyl ester of linolenic acid. This gave us a simulated soybean oil. When this "manufactured" oil was aged and given to the taste panel for comparison with authentic soybean and cottonseed oils, the panel invariably identified the modified oil as soybean. In other words, when we introduced linolenic acid into cottonseed oil we got much of the flavor instability that characterizes soybean oil. These experiments confirm previous work at the Northern Laboratory that removal (by liquid-liquid fractionation) of a large part of the glycerides containing linolenic acid resulted in oils with superior flavor stability.

This big problem of flavor stability is receiving attention, not only at Peoria, but also at the University of Pittsburgh, long noted for its interest in vegetable oils. Several years ago work was started there with assistance from the National Association of Margarine Manufacturers. For the past 2 years, Dr. B. F. Daubert and his fellow workers at Pittsburgh have had a



At left is apparatus for removing "foots" or sludge. Working at the table is Patricia Cooney, chemist, using a vacuum filter to remove bleaching materials. Seated at the right is Helen Moser, food technologist, titrating oil to obtain peroxide value—a chemical method of determining the amount of oxygen the oil has absorbed and which usually is a measure of its flavor stability.

\* One of the laboratories of the Bureau of Agricultural and Industrial Chemistry, Agricultural Research Administration, U. S. Department of Agriculture.



contract from Research and Marketing funds supervised by the Northern Laboratory. Their efforts have been directed toward the isolation and identification of the actual materials responsible for off-flavors in both liquid and hardened soybean oils. To be absolutely sure of their conclusions, they have not only isolated some of these materials, but synthesized them in order to obtain conclusive evidence of identity and structure. Their first work will be published shortly, but I can give a brief description of some of their results.

Liquid soybean oil is held at an elevated temperature until its flavor changes. It is then deodorized and the distillate (flavor constituents) is collected. This process is repeated again and again until a suitable amount of the flavor constituents plus, of course, many other compounds, is available. By a complex process of fractionation, the distillate is separated and the single compounds isolated and identified. From the liquid oil three substances have been positively identified and a fourth fairly well characterized. From hardened oil, subjected to the same procedure, two of the same compounds and a third new one have been obtained.

### Work Together

All of the work at Pittsburgh is, of course, closely correlated with our work at Peoria. The substances isolated are added to soybean oil and tasted by the Peoria panel, and there is continual exchange of ideas and visits between the two groups. The work at Pittsburgh is continuing under a new contract for an additional 2 years. In this new phase, special attention will be devoted to the oxidized products arising from hydrogenated linolenic acid. This new work ties in directly, therefore, with our experiments showing the importance of linolenic acid to flavor. Both the American Soybean Association and the National Soybean Processors Association have been active in urging and supporting this contract work at Pittsburgh.

Another field of work closely allied to flavor stability relates to soybean phosphatides. Research at the Northern Laboratory was started with the feeling that phosphatides might be responsible for a large part of the flavor problem. These materials present a real challenge to the chemist. Few industrial products used in such volume are so incompletely understood. Consider for a moment the nutritional values of soybean lecithin of which we are aware. Soy lecithin is rich in choline and inositol, both important factors for growth and lactation and for prevention of certain types of fatty liver degeneration. Choline and soybean lecithin are effective in preventing perosis or "slipped tendon" in poultry. Less well understood is lecithin's property of making carotene and vitamins A and D more efficiently utilized. In addition to these and other nutritional values, soybean lecithin performs important functions as a source of available phosphorus and fat acids. It is easily apparent that more knowledge of the nutritive value of lecithin and its role in feeding is needed.

Our Northern Laboratory is currently cooperating in the study of a new medical use of soybean phosphatides. Some human patients are unable to utilize fats taken into the stomach; however, they can use fat injected into the blood stream as a water emulsion. Of many commercial emulsifiers tested for making oil-in-water emulsions, only a few hold promise. The naturally-occurring phosphatides, principally soybean lecithin, are currently being used because of the absence of hemolytic activity. However, the stability of these emulsions on storage needs to be improved.

### Lecithin

It is expected that individual compounds present in the complex mixture which we refer to as soybean lecithin, will have particular properties which would recommend them for specific uses over the properties of the mixture. We have learned, on a laboratory scale, how the individual components may be separated. We are now trying to select methods of fractionation that are applicable for larger-scale operation. When such methods are worked out, samples of fractions will be submitted to the many users of soybean lecithin for testing and evaluation.

The possibility of improving the chemical and physical properties of soybean lecithin by chemical reaction and modification has been given little attention. Research on this is currently in progress at the Northern Laboratory and our experiments show that the physical form of commercial soybean lecithin may be varied progressively from its normal pasty consistency to a resinous solid. Lecithin's solubility in petroleum solvents may be decreased, depending on the extent of modification from high solubility to insolubility. Similarly its solubility in acetone can be increased. Perhaps the most unusual result of the new chemical treatments is the improved water dispersibility of the modified lecithin. Just what these alterations in physical and chemical properties will mean to utilization and whether the products will find application in edible and industrial fields is a subject of current study.

The only other plant phosphatide of commercial interest is obtained from corn oil. Corn "lecithin" is quite similar to soybean "lecithin" in many of its properties. Applying to corn lecithin the same fractionation methods found successful for soybean phosphatides, we have found two major types of inositides in the alcohol-soluble fraction similar to those found in soybean phosphatides. The alcohol-soluble portion also contained lecithin, but only a small amount of cephalin.

The number and complexities of the compounds involved, the extreme lability of many of their components, and the peculiar and intricate inter-relationships in solubilities all combine to make this a most difficult field of endeavor. The work so far conducted, largely basic, has provided a foundation upon which, it is hoped, practical applications can be built.

### Soy Flour

The last phase of our soybean research I shall discuss is also the most recent at



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the Northern Laboratory. At Peoria we have been interested in, and have cooperated with, many others in studying and evaluating the splendid possibilities of soybean flour for human food. Only recently, however, again through the use of Research and Marketing funds, has it been possible to install the extensive baking and dough-testing equipment, as well as to engage the trained staff, which makes possible research in this field.

The use of soy flour as a supplement to wheat flour results in a marked improvement in the nutritional value of bread. The objective of our soy flour program is to make its nutritional advantages more widely available through expanded use of soy flours in baked goods. It is hoped this can be done by development of improved products, better production methods, more careful selection of beans for processing, or even by fractionation or chemical modification.

The commonly accepted objections to the use of soy flour in commercial baking are: (1) The deleterious effects some soy flours have on dough handling properties, thereby limiting the use of machines in bakery production; (2) the reduction of loaf volume often obtained, and (3) the color introduced by adding soy flours.

Our approach to these problems is to first survey commercial production of the various types of soy flours produced by the industry over a 6-month period. The initial phase of this survey, dealing with evaluation of commercial full-fat flours, is nearly completed and has required the baking of more than 1,600 loaves of bread.

The soy flours were evaluated by standard baking procedures to determine their (1) effect upon water absorption of doughs; (2) effect on mixing time; (3) effect on oxidation requirement and tolerance of doughs; (4) effect on the physical or handling characteristics of doughs;

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# RESEARCH AFFECTING THE FEEDING *of Soybean Oil Meal*

By J. W. HAYWARD

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**T**HIS SUBJECT was assigned to me with the suggestion that I include information on the recent much-explored and publicized topic of antibiotics, including vitamin B-12 or APF, and try to show how these developments affect the feeding value, as well as potential use, of soybean oil meal. I intend to go back, beginning some 30 years ago and give you a sketchy review of nutritional findings affecting the use of soybean oil meal as a feed for livestock and poultry. However, before I do this, it appears advisable to dwell briefly on the matter of the supply and demand picture relative to soybean oil meal.

Last year the production of harvested beans was over 222 million bushels from about 10 million acres. The production of meal from last year's beans will certainly be over 4 million tons.

The government crop report of Aug. 1 predicts a record soybean crop of 270.7 million bushels for this year from approximately 14.5 million acres. This is 48.4 million bushels above the production of last year. If this production of some 270 million bushels of harvested soybeans is achieved, and if the customary amount of the total beans is processed, this crop would yield approximately 5 million tons of soybean oil meal.

There is, apparently, a sufficiency of equipment capacity to process in 1 crop year the beans estimated from this year's production. For instance, in March alone of this year, some 18 million bushels of soybeans were processed and we know that a sizeable amount of Expeller capacity was not operating during March or for a large part of this crop year, for that matter.

Soybean oil meal is a very important feed ingredient in this country because of the large annual production and because of the considerable quantity of high quality protein it contains.

There should be some consolation with respect to potential demand for soybean oil meal as a feed from the following speculations:

It has been estimated that if the United States hog crop of 1940 is taken as a normal production, and if these hogs were fed properly balanced rations, there would be a potential need for some 3 million tons of soybean oil meal; even if it supplied only half of the supplementary protein. Only a few years ago, we estimated that poultry feeds represented a potential outlet for some 800,000 tons

of soybean oil meal annually. This was based on a normal poultry population and the use of soybean oil meal at conservative levels along with animal and marine protein and the other constituents necessary to properly supplement soybean oil meal. More recently, the level of soybean oil meal in poultry rations has stepped up, and the level of animal and marine proteins reduced. APF concentrates especially vitamin B-12 carriers, made this possible. This change, along with an increase in the population of poultry as broilers, makes one wonder if the annual potential outlet here for soybean oil meal isn't somewhere near 2 million tons.

## Big Markets

Here you have, then, two outlets—hog feeds and poultry feeds, representing a potential annual market for 5 million tons of soybean oil meal, or about what is predicted for this next crop year. We may have this potential market a little high, but certainly not enough so but that the demand for use in cattle and sheep feeds will make up the difference. Even though we have predicted a very healthy potential market and a sufficient one to accommodate our increased production of soybean oil meal, we must not become conceited and think that a selling job does not need to be done. A study of Table I shows that soybean oil meal is way out in front of other competitive proteins as to supply. However, at the same time, a study of this table should convince one that soybean oil meal does have competition. I believe our problem on markets for the protein concentrates is a common one with the feed manufacturer, the supplier, the feeder and in the instance of soybeans a common one with the processor and with the soybean grower, who in most instances, represents a potential outlet for a considerable tonnage of soybean oil meal.

Here in brief is what I am driving at—the present total supply of all protein concentrates is figured at somewhat over 9 million tons annually. This production is considered sufficient to balance only about one-half of all farm grains fed to livestock and poultry in the United States. In other words, some 18 million tons of protein concentrate would be required each year to supply sufficient protein in feeds consumed annually by our livestock and poultry population. It is evident then, that we all have a selling job to do and the re-

sult would benefit every group mentioned above. The feeder benefits in that he is bound to realize more returns on his feed dollar by supplying his animals with adequate protein, providing his animals are properly managed and providing that he selects or feeds animals with an inherited potential capacity for economical production, whether it be meat, milk, eggs, or wool.

There are a couple other recommendations I wish to pass on to you folks with all seriousness:

1—This past year, for instance, feed prices as a whole have been pretty high on the basis of the finished product. Feed prices were very high for poultry, especially broilers. These high feed prices have not been necessarily the result of limited supplies, but reflect mostly pegged or supported prices. The selling price on soybean oil meal for a while was very high, but still, I have gotten the impression during these times that many soybean growers and soybean processors fully expected the high price of soybean oil meal of a few weeks ago to continue—in fact, they saw no reason why it shouldn't be higher. We deserve a just price for soybean oil meal, but we do not want to price our product out of the market.

2—The other point I wish to call to your attention is relative to the importance of each grower of soybeans doing his share by adequate feeding of good animals and by good management in creating a market for soybean oil meal. Our feeders of livestock and poultry represent a market for some 95 percent of all of our soybean oil meal produced annually. That is, the feeder represents the final consumer. However, our feed manufacturing industry represents our principal primary outlet for soybean oil meal. It is estimated that some 80 to 85 percent of our soybean oil meal production is sold directly to feed manufacturers. Can't you see then, that you, a soybean grower, have an obligation to the feed manufacturer to perpetuate a market for soybean oil meal from your soybeans?

Now let's reminisce for a while and consider some of the nutritional developments over the past some 30 years that have taken place in making soybean oil meal the highly respected protein concentrate it is today. When the chemists and nutritionists in this country started examining and exploring soybeans and soybean oil meal for the possible use in feeds

TABLE 1. PRODUCTION OF PROTEIN CONCENTRATES IN THE UNITED STATES

Protein Concentrate	Crop Years—October 1 to September 30							
	Average 1936-40 1000 tons	Average 1940-45 1000 tons	1945-46 1000 tons	1946-47 1000 tons	1947-48 1000 tons	1948-49 1000 tons	First 3 1949-50 1000 tons	
Soybean oil meal	483 <sup>2</sup>	2,743	3,837 <sup>4</sup>	4,086	3,833	4,329	3,536	
Linseed oil meal	450 <sup>2</sup>	783	562 <sup>3</sup>	374	625	687	485	
Corn gluten feed and meal	450 <sup>2</sup>	847	776 <sup>3</sup>	1,040	799	848	668	
Cottonseed	2,053 <sup>2</sup>	1,898	1,409 <sup>4</sup>	1,428	2,016	2,415	2,123	
Peanut	34 <sup>2</sup>	98	80 <sup>4</sup>	113	107	93	118	
Copra	78 <sup>2</sup>	71	67 <sup>4</sup>	194	170	120	102	
Tankage and meat scraps <sup>5</sup>	642 <sup>2</sup>	856	693 <sup>2</sup>	690	750	775	—	
Fish meal <sup>1</sup>	157 <sup>2</sup>	217	188 <sup>2</sup>	183	189	174	111	
Dried milk <sup>3</sup>	135 <sup>4</sup>	111	100 <sup>2</sup>	115	90	95	—	
Other dried milk products <sup>4</sup>	1,616 <sup>4</sup>	1,628	1,360 <sup>2</sup>	1,300	1,265	1,300	—	
Total	6,197	9,252	9,072	9,525	8,844	10,836	7,143	

(1) Average 1940-45 Agri. Statistics, 1946.

(2) U.S.D.A. Statistical Bulletin No. 85, Feed Statistics, Dec. 1949.

(3) Weekly Feed Market Summary, Minneapolis, Minn., and Feed Situation, June-July 1950.

(4) Feed Situation—November 1947.

(5) Estimated Disappearance of Feeds, Agricultural Statistics, 1946.

(6) Average 1935-40 Ag. Statistics, 1946.

(7) Includes dried &amp; concentrated skim milk, buttermilk &amp; whey manufactured for animal feed.

(8) Dry equivalent of skim milk, buttermilk, whey and whole milk estimated fed on farms.

for livestock and poultry, they found principally that:

1—The protein of soybeans and soybean oil meal contained all of the essential amino acids and in amounts similar to proteins respected as being biologically complete with respect to amino acids; such as milk proteins, egg proteins, protein of meat, fish and certain glandular products.

2—Way back about the time that the information on amino acids was made available, it was also discovered that soybeans and soybean oil meal were deficient in minerals and that they had to be supplemented with especially calcium and phosphorus when used in most rations for livestock and poultry.

3—It was also discovered way back then that the fat or oil in soybeans tended to produce soft carcasses or soft lard in pigs when these animals consumed a ration containing an appreciable amount of whole or ground soybeans whether they were raw or cooked.

4—About this time, also, it was discovered that even though protein in raw soybeans seemed to be of high quality, these soybeans whether fed whole or ground, failed to produce satisfactory growth of white rats, chicks and pigs. The protein of raw soybeans and raw soybean products was also found then to be inadequate nutritionally for humans, or it was imagined that it would be.

5—A little later, possibly 10 years, nutritionists proved that the protein quality of soybeans and soybean oil meal could be brought up to expectations by subjecting these products to proper cooking or what was oftentimes spoken of as "roasting". However, even with the cooked or roasted soybeans, the tendency of them to produce undesirable soft pork, when fed to growing pigs, persisted.

6—Along about this time, a group of investigators showed that proper cooking of soybeans and soybean oil meal tended to make the sulphur-containing amino acids, especially methionine, available for use by the animal. It was likewise shown that unavailability of methionine was the limiting factor in the protein of raw soybeans and undercooked soybean oil meal. It was also demonstrated in these studies that a properly cooked soybean oil meal, as to good protein quality, could be pro-

duced by each of the three methods of processing: namely, hydraulic, Expeller and solvent extraction.

By this time, which was about 1935, it was demonstrated that a properly processed soybean oil meal could be substituted for say, about 5 to 10 percent of the protein carrier of animal origin in a conventional chick starter or complete pig feed providing the difference in minerals, mainly calcium and phosphorus, was taken care of. It was about this time that some of our mysteries of milk products, alfalfa, dried brewers yeast, fish meal, and animal by-products started to unravel. Presently, separate nutrients, especially of the B-complex were isolated or at least concentrated and identified. One of the important nutrients, probably the most important to soybean oil meal that was identified in milk, liver, yeast, and even alfalfa, was riboflavin. Riboflavin is contained in greater amounts in soybean oil meal than in grains and its by-products, but still, the content was way under that of the aforementioned products and even below the content of fish meal and most samples of animal by-products. Not only was riboflavin made known about this time, as well as many of the other vitamins of the B-complex, but riboflavin was presently available in a crystalline form and in some distillery fermentation products at rather high levels.

About 1937, or the time that many of the important B-complex vitamins were identified, the work also progressed rapidly on such important nutrients as choline and manganese. The first importance of these two nutrients (the first a vitamin

and the second, a mineral) was assigned to perosis in poultry. Quite a little later on, choline was found to spare methionine in soybean oil meal and to be important in methylation processes in the animal's body.

It was a little before 1940, I believe, that research workers revealed an interrelationship between certain vitamins and especially between certain vitamins and the amino acids. I have in mind, especially, the sparing action of choline for methionine and the interrelationship between nicotinic acid, often spoken of as niacin, and tryptophan, which is one of the two important essential amino acids quite deficient in the protein of corn. Nicotinic acid, or niacin, didn't seem to have any importance in practical rations for a long time, and this was true, also of many of the other B-complex vitamins except riboflavin. More recently, nicotinic acid has come to the front, especially for use at small levels in high efficiency diets containing corn as the only grain. Undoubtedly, a lack of sufficient nicotinic acid in corn was part of the reason for failure of some corn diets in the past and the reason for the recommendation for many years—in fact, until recently, that several grains be used in rations for chicks, poultry, and pigs.

## In Chick Starters

By 1940 or shortly thereafter, considerable information was available as evidence that a properly processed soybean oil meal could be used at a considerable level in chick starters, providing that the ration contained at least 3 percent of a good grade of fish meal. This meant that for some reason fish meal at this low level was supplementing soybean oil meal, with the result that such a ration, adequately supplemented otherwise, gave as good growth and feed efficiency as conventional rations formerly used containing 5 to 10 percent of milk products, with possibly the rest of the added protein consisting of meat and bone scraps, or a combination of meat and bone scraps and fish meal. Mind you, this was quite a big step and also, mind you, that the soybean oil meal ration was intelligently fortified with riboflavin, vitamins A and D, manganese, and other essential minerals. Meat scraps did not supplement soybean oil meal at the same low level as did fish meal, and several investigators found that the protein of meat and bone scraps and tankage did not improve the relative protein efficiency of soybean oil meal when combinations were used. Combination of fish meal and soybean oil meal did have a higher biological value than soybean oil meal alone. A good review of these developments up to the early 1940's is contained in a publication I have cited by G. F. Heuser and L. C. Norris<sup>1</sup> of Cornell University. Here is quite a significant statement made by these research workers—"When a small amount of animal protein was used (3 percent of fish meal), the remainder of the supplementary protein (in a chick starter) could be furnished by 25.5 percent of soybean oil meal—".

Even before the above mentioned de-

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velopments with poultry, we had learned from universities such as Purdue, Iowa, Illinois, Ohio, Wisconsin, and Minnesota that even when mineral deficiencies were adjusted by the addition of suitable carriers of calcium and phosphorus, that soybean oil meal was materially benefited in rations for pigs with initial weights of 50 to 60 pounds by including in the rations proteins of animal or marine origin; namely, meat and bone scraps and fish meal. Supplement No. 5, developed at Purdue University by Vestal<sup>3</sup> is an example of early confidence in greater use of soybean oil meal in rations for fattening of hogs in dry lot. This ration consisted of meat and bone scraps, 20 percent; Menhaden fish meal, 20 percent; soybean oil meal, 40 percent; cottonseed meal, 10 percent and alfalfa, 10 percent with the privilege of substituting 60 percent tankage for the meat and bone scraps. We learned later to appreciate the value of fish meal in this sort of ration for growing pigs.

The above information on the nutritional requirements of poultry and pigs was available pretty well by the beginning of World War II and assisted the feed manufacturing industry materially in compounding good feeds for these critical animals during the war years, when many conventional ingredients were decidedly limited in supply. It was indeed a blessing that soybean oil meal was available in goodly quantities during these lean years. Due to this, and our knowledge on how to use soybean oil meal, our nation made records in the production of meat, milk and eggs. Our armed forces were well fed and we received adequate nutrition without materially changing our food habits.

## Phosphorus

I have purposely listed in the above a sketchy account of some of the fundamentals of nutrition with respect to the use of soybean oil meal in rations for non-ruminating animals. Before I get into vitamin B-12 and the antibiotics, let me cite a few other developments that have improved our soybean oil meal rations for these animals. Some guesses were advanced, but it was not much before 1945 that adequate evidence appeared in the literature making us people in the nutrition field conscious of the kind of phosphorus in poultry rations containing appreciable levels of soybean oil meal. We learned that approximately 50 to 75 percent of the phosphorus in soybeans and soybean oil meal was present in the form of phytin phosphorus. Pigs and rats were apparently able to utilize phytin phosphorus effectively; whereas a chick is unable to make good use of this type of phosphorus. It therefore became apparent that we should add some inorganic phosphorus to poultry rations containing soybean oil meal. This has been more recently defined as .4 percent of inorganic phosphorus in a chick starter, turkey starter and laying and breeding mashers for poultry.

After World War II or during our post-war years, the feed industry became more quality conscious regarding ingredients in

mixed feeds, or it may be that due to availability of supplies they could be more demanding. Immediately soybean oil meal was subjected to scrutiny. Some of the facts here are: hydraulic equipment was completely abandoned by this time; new solvent extraction plants were erected where they could not be during the periods of '42 to '46. We found occasional undercooked meals produced by new operators of solvent extraction equipment, but this was corrected shortly. There has since been quite a concentrated effort to have the soybean oil meal of the industry more uniform in appearance, especially as to color and texture. Undercooking of soybean oil meal is now a thing of the past for the most part, but there is still occasional danger of overcooking soybean oil meals. For the most part, Expeller soybean oil meals are more apt to be overcooked than solvent extracted meals.

## Solvent Meal

The most recent trend in processing of soybeans shows a steady gain in favor of solvent extraction equipment. It is generally thought that for the crop year 1950-51 the production of soybean oil meal and industry processing of soybeans will be something like 70 percent solvent and 30 percent screw press. The switch over to a predominance of solvent extracted soybean oil meal is welcomed by us nutrition men, especially with respect to the use of soybean oil meal in rations for critical animals, such as poultry and swine. A good meal nutritionally has been and still can be produced with screw presses, but generally some sacrifice has to be made in the yield or capacity to produce an expeller soybean oil meal of optimum nutritional value. This is not true with the solvent extraction equipment, if the plant is equipped with adequate facilities for proper cooking of the meal.

A goodly number of research workers have, during the past few years, been working double time to find out what it was in fish meal, fish solubles, milk by-products, and to a certain extent, in packing house by-products, when incorporated along with soybean oil meal in rations for hogs and poultry, that has resulted in better growth and reproduction or hatchability, than was the case when soybean oil meal was used alone as the entire source of added protein in fortified grain rations. The fact that there seemed to be something in these animal products, or products of so-called animal origin, which was needed by plant proteins, led to coining the term of "APF" or "animal protein factor". Remember, we are still speaking of non-ruminating animals. It was not long ago that this unknown vitamin called APF was found to be present in the manure of cows and chickens, and experiments on chicken manure indicated very clearly that bacterial synthesis accounted for the presence of this vitamin. It wasn't long before supplements containing the vitamin were produced commercially by fermentation. At about the same time, a new growth factor required by certain bacteria was isolated in pure form and designated "vitamin B-12". Pure vi-

tamin B-12 was as effective in supporting growth of chickens as were concentrates prepared from cow manure, and it proved to be required for hatchability. Shortly after this development, APF concentrates featuring vitamin B-12 were made available for use in poultry and swine feeds along with soybean oil meal. Although some research workers have advocated substitution of APF concentrates for all of the protein of animal or marine origin, the feed industry as a whole has not complied with these "all out" recommendations. APF concentrates containing vitamin B-12 were immediately adopted and have been used generally by feed manufacturers in rations for non-ruminants, but for the most part, some of the animal or marine protein has been retained.

Please remember that vitamin B-12 is nothing new in the crude form, at least. It is merely an identity of an unknown factor(s) called APF, which have been supplied in mixed feeds right along for non-ruminating animals by inclusion of proper amounts of fish meal, fish solubles, milk by-products, and to a limited extent, packinghouse by-products such as meat scraps and tankage. Don't think for a minute, however, that the discovery of vitamin B-12 was not important. It certainly was, and the availability of APF or Vitamin B-12 concentrates makes it possible to conserve on supplies of fish products and the like. There was less than half enough vitamin B-12 from natural sources to adequately fortify rations for swine and poultry. Now we can go the limit and juggle ingredients with our mind on economics as well as nutritional quality in making our selections.

Not long ago, the discovery was made that the organisms used commercially to produce certain antibiotics also produced considerable quantities of vitamin B-12. Shortly, it was found that a by-product from the manufacture of aureomycin promoted growth in chicks, pigs and rats at a faster rate than did pure vitamin B-12. This was interpreted at first as a response in addition to vitamin B-12, due to another factor of the APF complex. It was not long after this that research workers at the Lederle Laboratories found that the portion of the growth stimulating effect in the fermentation product, which was not due to B-12, was due to the antibiotic, aureomycin, being the product.

## Antibiotics

We understand that the antibiotics, penicillin, streptomycin, aureomycin, and terramycin are equally effective in increasing the growth rate of chicks, poults, and pigs, and that their effect is in addition to vitamin B-12. The antibiotics are certainly not a part of the APF complex, or at least, we have no knowledge of these antibiotics being contained in the natural sources of vitamin B-12, such as fish meal, fish solubles, milk and other animal by-products.

For those of you interested in a rather recent good review on aureomycin, I suggest that you read the article cited by Stokstad<sup>4</sup> of Lederle Laboratories. Then

for a good review of the APF, I suggest that you read an article by Dr. Cravens<sup>5</sup> of the University of Wisconsin. Dr. H. R. Bird has a good review of a lot of these nutritional developments discussed here in a recent article.<sup>6</sup> Dr. Bird is chief of poultry investigations, U. S. Agricultural Research Center, Beltsville, Md., and has devoted many years to investigating nutritional problems pertaining to the use of soybean oil meal in poultry feeds.

To clarify some of the statements I have made as to the complexity of present day nutrition and to illustrate the importance of vitamins, including B-12 and recent findings on antibiotics, I will briefly review two publications. The first is by W. M. McMillen and associates<sup>7</sup> of Michigan State and is confined to the effect of liberal B vitamins or B vitamin supplementation on growth of weanling pigs fed rations considered quite adequate in nutrition. In this experiment, they used eight pigs per lot with the pigs having an initial weight of about 27 pounds, and the trial lasted 9 weeks. The basal ration consisted of corn, 68 percent; soybean oil meal, 12 percent; meat scraps, 12 percent; alfalfa meal, 5 percent; and a complex mineral mix, 3 percent. This basal ration resulted in the pigs making an average daily gain of 0.66 pounds. The basal, plus either pantothenic acid or nicotinic acid, alone or in combination, did not materially improve rate of gain or feed efficiency. However, when riboflavin was used along with pantothenic acid and nicotinic acid, the rate of gain stepped up from 0.66 pounds daily for the basal to an average daily gain of 1.01. The addition of vitamin B-12 did not improve the results, and I suppose this was because the ration contained an appreciable level of animal protein. These investigators also failed to cause any improvement in daily gains or feed efficiency by additions of thiamin, pyridoxine and choline on top of the former combination of basal plus pantothenic acid, nicotinic acid, riboflavin, and vitamin B-12. This work not only is suggestive of the vitamin supplementation needed in rations containing soybean oil meal for young pigs, but suggestive of nutritional deficiencies in what one must consider a conventional ration for this age of pigs.

The next experiment I wish to review is by R. W. Luecke and associates<sup>8</sup> also of the Michigan State College of Agriculture. This experiment dealt with the effect of vitamin B-12, animal protein factor, and streptomycin on the growth of young pigs. They used six animals per lot. The pigs had an initial starting weight of from 24 to 26 pounds. The feeding test lasted 6 weeks. The basal ration was corn, 75 percent; soybean oil meal, 22 percent; bone meal, 1 percent; salt, 1 percent; limestone, 1 percent; vitamin A, 2000 I.U./lb. of feed; vitamin D, 200 I.U./lb. of feed; nicotinic acid 15 mg./lb. of feed; calcium pantothenate, 10 mg./lb. of feed; and riboflavin, 2 mg./lb. of feed. The basal ration alone resulted in an average daily gain for the pigs of .88 pounds with feed required per pound of gain of 2.99 pounds. The use of crystalline B-12 at a level to supply

12.5 micrograms per pound of feed resulted in .98 pounds of daily gain with no change in feed efficiency. The third lot was fed the same as the second lot mentioned above except that in addition to the basal and crystalline vitamin B-12, they added streptomycin at 0.05 percent. Here, the average daily gain was 1.48 pounds, with feed efficiency about the same as for lot 1 and 2. In lot 4, the pigs received a basal ration plus an APF concentrate at 0.5 percent. This we imagine, was a Lederle product. For this lot, the average daily gain of the pigs was 1.43 pounds with feed efficiency unaffected.

Now you have heard a review of some

of the basic fundamentals in nutrition associated with the use of soybean oil meal in feeds for non-ruminants and I have touched the high spots on vitamin B-12 or APF and the antibiotics. At first, your reaction may be that soybean oil meal must be pretty terrible having these doctors pick all the holes in it. I am sure, though, your lasting impression is that it is a wonderful thing these investigators, and there are many more than I have mentioned, have had enough respect for soybean oil meal to devote so much attention to it nutritionally. This all adds up in my mind to this: that nutrition of today is indeed a science.



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Even though these developments may appear quite complicated, the information available is treasured, and in fact, indispensable for intelligent use of soybean oil meal in rations for non-ruminating animals, principally pigs and poultry. The use of antibiotics is too new to even make a prediction of its possibilities and entire consequences. Antibiotics affect the microflora of the intestinal tract and are probably useful only to increase growth and good health of the young non-ruminating animals. There is no indication that the effect of antibiotics carry over from the hen to the egg to the chick as does vitamin B-12 or certain other nutrients.

The feed industry is glad to have these tools as results of nutritional discoveries, but knowing the nutrition men of the feed industry as I believe I do, they are inclined to go slow on the use of antibiotics in starter feeds for pigs and poultry. They will use them. In fact, for the most part, they are using supplements containing one or more antibiotics and practically all mixed feeds contain APF concentrates and vitamin B-12 from this source. Also, for the most part, I find that most feed manufacturers are inclined to continue rather indefinitely using some fish meal and/or fish solubles, as well as some meat and bone scraps, along with appreciable levels of soybean oil meal in starters, growers, and breeding mashers for poultry, as well as pig starters and in feeds for brood sows.

Soybean oil meal also enjoys very satisfactory usage in fattening rations for hogs and laying mashers for poultry and naturally, of course, in rations for ruminants, such as dairy feeds, feeds for beef cattle, and for sheep.

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## ICE CREAM RULING

Federal Security Administrator Oscar R. Ewing has reminded the ice cream manufacturing industry that the food and drug administration, of the Federal Security Agency, continues to consider ice cream containing vegetable fats in the place of milk fat "adulterated within the meaning of the Federal Food, Drug, and Cosmetic Act."

In issuing this reminder, Ewing also stated that the Agency will reopen hearings on ice cream standards in Washington Nov. 13.

# The Soybean IMPROVEMENT PROGRAM

By M. G. WEISS

Principal Agronomist, Division of Forage Crops and Diseases Bureau of Plant Industry, Soils and Agricultural Engineering U. S. Department of Agriculture

**A**N IMPORTANT milestone in the development of the soybean industry in the United States has been attained during the past decade, 1940-1950. During this period the first soybean varieties developed through carefully planned controlled hybridization and selection programs were made available to growers. The development of these superior varieties and the extensive testing necessary to determine their value was made possible by a closely coordinated research program between the U. S. Department of Agriculture and the co-operating state agricultural experiment stations.

Prior to the past decade, soybean varieties in the major producing areas consisted of introduced strains or selections from such strains. Breeding programs which provided for the hybridization of varieties complementing each other in desirable characters made possible the development of varieties with materially higher yield, oil content, and lodging resistance. The soybean industry is now realizing the benefits from the first cycle of improvement accomplished through hybridization and selection.

## An Inventory

Possibly it is well to pause at this time and inventory the cost and benefits from research. Is the investment in research paying adequate dividends? As a nation we are accustomed to estimating value in dollars and cents—so let's put it on that basis. The estimates I'm making are entirely my own, and, as such, strictly unofficial, but I'll make a decided effort to estimate costs adequately high and make conservative estimates of benefits derived.

First, let's estimate the expenditure of public funds for the improvement of soybean varieties. Since the establishment of the U. S. Regional Soybean Laboratory in 1936, the federal appropriations for this purpose have totaled approximately \$150,000 per year. The amount of state appropriations is not known exactly, but let us assume that total state appropriations equal those from federal sources. To make sure that we haven't underestimated the cost of research, let's raise this amount to one-half million dollars annually. This is the liability attributable to research.

Now let us consider the assets side of the balance sheet. Let us ask what have been the financial benefits of research for soybean improvement. In the north central area, where the intensive breeding programs were first launched, several improved varieties have been released. Lincoln, Hawk-

eye, Adams, Monroe, and Wabash are the first of these varieties. These varieties are adapted to the area in which over 80 percent of the soybeans in the United States are produced.

If we estimate that 50 percent of the total soybean acreage is planted to improved varieties—and this is a conservative estimate—on at least 6 of the 13 million acres grown for soybeans in 1950 improved varieties are being grown. Comparative performance records of old and new varieties in regional tests permit an estimate of a 20 percent increase in yield and a 10 percent increase in oil content of the improved varieties.

What are these increases worth in dollars and cents? Considering an increase in yield of 3 bushels per acre, the 6 million acres growing improved varieties will produce 18 million additional bushels of soybeans. Valued at \$2 per bushel, the improved varieties will result in an additional income to growers of 36 million dollars.

What has the increased oil content contributed? With similar calculations estimating the value of oil at 10 cents per pound, the additional oil content of the acres growing improved varieties will increase the value of the 1950 crop by approximately 15 million dollars.

A total increase in value of the current season's crop of over 50 million dollars would seem a conservative estimate. With a total investment for improved variety research of 7 million dollars for the period 1936-50, it would seem that a 600 percent profit will be realized in this one crop season. Even though the above calculations were made with a dull pencil, the investment in research would seem a sound one.

We've confined the benefits realized from a 14-year period of research to economic gains which reasonably can be expected during the present crop season. Are there other benefits which have not been assessed? First, let us consider some of the fundamental studies conducted. In most of the breeding programs fundamental studies are incorporated into the program. The aggregating progenies of crosses from which superior plants are selected also are studied with regard to method of inheritance of specific characters, ease with which characters of parents are regained in the progenies, rapidity with which characters are fixed and can be measured in the segregating progenies, comparable efficiency of different selection methods, and many others. A wealth of knowledge is being accumulated which will improve the efficiency of subsequent breeding programs.





M. G. WEISS

An illustration of the practical value of such research can be made. The time required from hybridization of two varieties to ultimate release of an improved variety to growers was formerly thought to be 14 or 15 years. Testing of progenies during early generations of the inbreeding process coupled with extensive regional testing has reduced this period to 10 years. Mediocre varieties thereby can be replaced with superior strains in a shorter period.

Development of new varieties for other areas is well advanced. The moderately low oil variety, Habaro, soon will be replaced in the northern states by a variety having superior yield, lodging resistance, and oil content. In the southern and southeastern states, Roanoke has provided considerable improvement over generally grown varieties. When the regional testing program revealed the general adaptability and superior qualities of Ogden, a new variety developed by the Tennessee Agricultural Experiment Station, this variety rapidly replaced inferior varieties. New strains are available which give promise of filling the gap between the North Central and Southern regions where processors have been plagued by mediocre oil content. To date such new varieties are only test models, but they'll soon reach the production field.

Although superior varieties have been or soon will be released for most of the soybean production areas in the United States, I wish to reiterate that these varieties represent only the first cycle of improvement. There are no indications that any ceilings have been reached.

Another asset has been attained throughout the past decade in the form of an insurance policy—insurance against serious losses by diseases. Recently, while showing the experimental work at Beltsville to a group of agricultural students from a Midwestern college, I asked if anyone could name a disease of soybeans. Not one of some 40 farm boys from a heavy-soybean-producing region could name a disease. Nevertheless, diseases of other common crops were well known to them.

The lack of familiarity with soybean diseases is attributable to several factors. To date, no single disease has caused widespread losses of a spectacular magnitude. Does this mean that soybeans in general are more resistant to diseases than other crops? Possibly this is correct. Fortunately, no pathogen has been introduced or has developed to date which has caused widespread and severe losses. However, with continued intensive growing of soybeans, strains of pathogens may evolve which have greater virulence and will cause heavier losses than those now prevalent.

What are the future prospects of serious losses by diseases? The answer hinges largely upon the magnitude of our research effort. A number of pathogens have been found to which soybeans are highly susceptible. Some of these, notably brown stem rot and stem canker, are potentially highly destructive. Research by pathologists has contributed greatly to our knowledge of some of these diseases. These workers have studied the life cycles of some of the causative organisms, found how they overwinter, how infection is initiated, how they are spread from plant to plant. They've studied methods of isolating and maintaining the organism, and artificially inoculating plants to determine host-parasite relationships. They've inoculated many varieties and new strains to determine if genetic resistance is available in the species. They've observed the new strains and selections tested by the agronomists in regional tests for evidence of natural infections. However, not nearly enough of this pathological work has been done. Many diseases are still virtually unknown enemies of the soybean research worker.

When an army commander faces an enemy in the field, he knows it is necessary to first find the enemy, then fix him, fight him, and, lastly, destroy him. Many pathological enemies of soybeans have been found, a few have been fixed, and we're squared off to fight them. Destruction will only be ac-

complished when genetic resistance is incorporated into the varieties grown commercially, or complete control methods are developed. To date little has been accomplished in this regard.

## Resistant Varieties

However, there are indications of success. High types of genetic resistance have been found to the bacterial diseases—blight, pustule, and wildfire. In the South, where pustule and wildfire are particularly destructive, we are presently prepared to release varieties with agronomic and seed compositional characters equal to Ogden and Roanoke but with resistance to these pathogens. In plot trials where pustule and wildfire have been severe, yield losses of approximately 10 percent have been recorded. Should such losses become consistent it may be necessary to release resistant varieties—even though not superior agronomically.

Genetic resistance to most of the other diseases of soybeans is not so clear cut. However, during a trip through the south in recent weeks, we observed that differences in strain reactions seemed to occur to every disease observed. Until more is learned about many of these pathogens, it will be necessary to confine our fight against diseases to releasing varieties which do not show particular susceptibility to any of the serious pathogens.

The best time to rout an enemy is before he is entrenched. We are aware of what has happened to some of the other major crops when diseases attained epidemic proportions. It is our hope that research may prevent disruption by diseases of the economy of the soybean industry. Excellent progress has been made with the research facilities available. Progress in the future relative to keeping abreast of diseases as well as developing varieties with increased agronomic and seed compositional qualities will be directly proportional to the availability of research facilities.



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ALBERT B. DIMOND

**T**O GET into the city of Springfield and attend this convention it is almost impossible to miss the fact that central Illinois is soybean territory. It might be done in the middle of the night in the dark of the moon and blindfolded, but in that case even the State Capitol could be missed.

Here we have two neighboring cities, Taylorville and Decatur, that have claimed the title, "Soybean Capital of the World". We have several counties that produce annually over a million bushels of beans each. Soybeans are big business in Illinois. Our local elevator calculates that it will take \$200,000 in operating capital to handle the crop this fall. To no one are soybeans bigger business than to the farmer who raises them.

Traditionally the American farmer has been and is an experimenter. He continually looks for ways and means to improve his crops and methods of raising them and for new crops and improved varieties of livestock that can be produced and sold at a profit. George Washington introduced alfalfa into this country. Thomas Jefferson ran his plow furrows around the hill—contour farming. The grain drill was devised in Minnesota because birds ate the seed that was broadcast. The steel plow, the reaper, tile drainage, are all American innovations. Later came the tractor, combine, corn and cotton pickers, hybrid corn and soybeans. This is by no means a complete list. The 200-pound hog in 6 months and

## PRODUCERS

# WHY A FARMER GROWS SOYBEANS

By ALBERT B. DIMOND

Lovington, Ill.

300-egg-a-year hen are results of this desire to do it better for more profit.

It is this aggressiveness in all segments of our economy that has made our nation the envy of the world. It is vital to our nation that agriculture possess and maintain a continuing progressive outlook because this is the reason why the American citizen is asked to spend a smaller portion of his income for food than the citizen of any other country in the world—and at the same time give the producer of that food an opportunity to own an automobile.

As a direct result of this experimenting the soybean was introduced into this country. The soybean made a most spectacular and rapid rise to prominence as one of the nation's leading crops. It came in to fill a need and is an excellent example of the way a progressive agriculture meets its problems.

### Wants Profit

The farmer grows soybeans primarily because they are a crop which he can grow and sell at what he hopes will be a return comparable to or preferably better than other uses for his land, labor, and machinery. He hopes to make a profit.

The demand for soybeans and their products has never been fully satisfied. By that I mean we have never had any appreciable carryover from one season to the next such as is the case with most agricultural commodities. Maybe they have not always moved at the price we hoped for but they moved. This year we have prospects of a 275-million-bushel crop—the largest in history. Will they be gone by this time next year? No one knows. Who knows what the market will absorb? As a farmer I am interested in producing commodities that are wanted and that I can produce at a profit.

The basis of good land use on soils that are adapted to crops is a crop rotation. Our agronomists have been preaching this for years. Soybeans shine in this respect in all regions where they are adapted. In the Cornbelt particularly they fit admirably into the transition from corn to small grain to legumes and grass and back to corn. They compare favorably with second year corn and furnish a better seedbed for small grain. By the use of early varieties the crop may be harvested and the land sown to winter grain or cover crops to slow down erosion. It is a regular occurrence to have

better oats on soybean stubble than on stalk ground and oats are a notoriously low profit crop. Professor Mosher of the extension farm management service of the University of Illinois has said that after 25 years of looking at farm records he has reached the conclusion that the only excuse for oats is as a nurse crop for clover. The University of Iowa in tests got 20 percent better oats following soybeans. The farmer who uses oats for his nurse crop for legumes should consider soybeans.

Right along with crop rotations comes the soil erosion problem. This has been getting a lot of publicity lately—and the problem is real to be sure—but is nothing new. Some alarmists would have it that the soybean is the culprit. Without a doubt we have exploited our fertile land, but I have faith enough in American agriculture to believe it will come up with the answer. Last year according to the National Fertilizer Association, farmers of Illinois applied approximately twice the amount of phosphates to their soils that was removed in crops. In driving along roads in the state notice the increasing number of grass waterways through the corn and bean fields. Farmers can and will preserve their heritage even though they do raise a whale of a lot of soybeans.

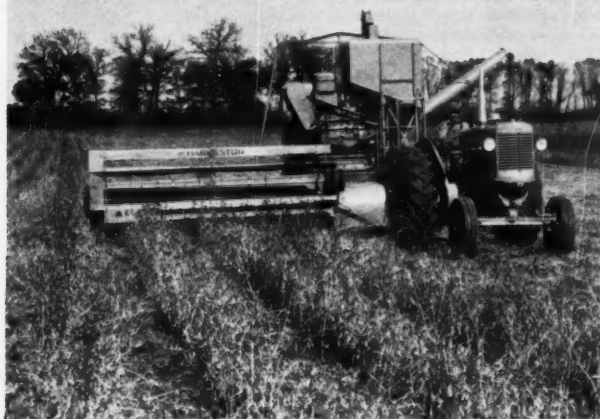
Soybeans are one of our most dependable crops. As yet no disease except brown stem rot has bothered them too much. That can be held in check by proper rotation of crops. Chinch bugs and corn borers leave them alone. In 1936 things were pretty dry at our place. Small grain fizzled, we got a fair stand of corn and beans, when along came the chinch bugs and some grasshoppers and about cleaned off the clover and pasture as well as the corn. Then they proceeded to clean the grass and weeds out of our field of beans. Those beans made 26 bushels to the acre. We have had better yields since but never a field that looked any better to us.

Soybeans are essential to the livestock economy of the country. Certainly we do not want to dry up any source of protein feed, and soybean meal is one of the best. To attempt to raise livestock or poultry without these supplementary protein feeds is in the same category as raising corn without clover. It is economically unsound—or a slow way to starve to death. Last week in a national farm magazine there was an article especially interesting to me because it concerned a neighbor. V. I. Win-

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# MINNEAPOLIS-MOLINE

MINNEAPOLIS 1, MINNESOTA

nings left the bean meal out of the ration for his dairy herd for 1 week and lost \$21 on his milk check over the cost of the meal. His ration was corn and cob meal, ground oats, and alfalfa hay, plus or minus the soybean meal. Now Vernie milks 20 to 25 cows, good ones too as attested by dairy association records. He has cows up around the 500-pound butterfat mark regularly. You can be assured soybean meal went back into the dairy ration. Vernie raises soybeans too, 40 acres or so every year.

The soybean has a wide range of adaptability both as to climate and soil type. It used to be thought that good corn soils were the best place for them and they do well there. However they are spreading out and our plant breeders and agronomists are making them click in places no one thought of before.

Now let's get to the real reason why I

raise soybeans. It may be compared to the 10 reasons why I drive one of the most popular three instead of a Cadillac-Fleetwood. The first is financial. The other nine are — immaterial. The producer has plenty of competition for his land and labor and few are in position to deliberately ignore the probable financial returns in making crop plans. Contrary to some opinions there are too few farmers in that tax bracket.

The soybean industry is large but if little Asa is to reach his full stature there needs to be a plentiful supply of the raw material for processing plants to work with. As adaptable as the soybean is and as well as it can be fit into the operations of many farmers, volume of production can only be maintained and expanded when the farmer can produce them at a return comparable to other crops. Price incentive will bring out the beans. But please, let's do it some other way than by government edict.

## Use of Chemicals IN WEED CONTROL AND HARVEST DRYING OF SOYBEANS

By R. E. CARLYLE

Monsanto Chemical Co., St. Louis, Mo.

**S**OYBEAN ACREAGE in the United States has now reached a total of approximately 13 million acres each year. Naturally an acreage of this size presents an inviting potential use for chemical herbicides as well as any other operation such as harvest drying.

As far as herbicides are concerned, soybeans have been something of a problem. As yet 2,4-D is, generally speaking, the cheapest and most effective herbicide yet developed. Unfortunately this compound cannot be used on soybeans as the beans are a broadleaved leguminous crop that is susceptible to 2,4-D. Its use results in death to the crop as well as weeds.

At this point we should all be clear on the general classification of herbicides and any user should endeavor to understand in a general way why and where each type is best used.

### Classification

In general most herbicides used today fall into two main categories. First are the *contact types*. These are chemicals which kill all kinds of weeds and plant growth which come in contact with the chemical. These compounds in general are not selective; that is, they are not specific for one type of plant and not another. Examples of these chemicals are sodium chloride, calcium chloride, sodium chlorate, sodium arsenate, sodium hydroxide, sodium borate, sulfuric acid, the phenol compounds (pentachlorophenol and salts, the dinitros), oils and

distillates, and combinations consisting of emulsions of oils and the phenol compounds.

Generally speaking this whole class of compounds cannot be sprayed directly on soybeans without killing the crop as well as the weeds. In other words, no contact chemical has been discovered as yet which is selective as far as soybeans are concerned once they have germinated and emerged. More will be said of pre-emergence treatments later on.

Secondly, there is a large group of chemicals which are generally known as *selective weed killers*. This class of compounds, as the name implies, kill weeds but do not harm crops.

Selectivity is obtained in a number of ways such as actual tolerance of a species of plants, differential wetting, location of growing points, selective spray placement, and differences in growth habits which may involve dormancy and depth of root systems. Actually many selective herbicides are also contact types, but selectivity is obtained by varying the concentration or wetting ability of the final spray.

While no herbicide is known that destroys all weeds without harming crops, still research is gradually revealing an increasing number of particularly organic compounds, that are truly selective. For example, 2,4-D will kill weeds such as mustards, radish, and pigweed in cereals, and if proper timing and concentrations are used, the corn, wheat and oats are unharmed.

There are various ways of grouping the

selective herbicides but one way is as follows:

**A—The dinitros.** These compounds are not effective on grassy weeds.

**B—Oil selectives.** These herbicides are quite specific and only certain oils can be used on certain plants. For example, especially selected oil fractions have been used to control wild oats in flax. Considerable experience or the advice of a specialist is necessary in using this type of selective.

**C—2,4-D selectives.** These herbicides are used largely in controlling broadleaved annual weeds, particularly in cereal crops, eliminating undesirable brush and some water weeds. In general, it is not safe to use this group of herbicides on broadleaved crops such as soybeans.

**D—Another group of rather unrelated selective herbicides** are sometimes known as the grass killers. In the main, these are isopropyl N-phenyl carbamate (IPC), trichloroacetate (TCA), phenyl mercuric acetate sold under various trade names, and potassium cyanate. This group have not generally been as spectacular as 2,4-D in their action, but so far they are the best unearthed as grass killers.

With this short review we can devote our attention to the chemical weeding of soybeans. This crop is, of course, a legume and belongs to the broadleaved type of plants. Hence the great majority of known herbicides cannot be used on soybeans in sufficient concentration to kill weeds. All of them have not been thoroughly studied, but certainly we know that many of both the selectives and contacts cannot be sprayed directly on and sometimes not even near soybeans once they have emerged.

Another avenue, however, was to study the possibilities of using some of these compounds in the pre-emergence type of treatment. The term pre-emergence in connection with herbicides is used to describe the practice of spraying or applying a chemical to soil just before the weed seeds germinate or in any event, prior to emergence of the crop. Ordinarily speaking, this is the ideal way to eliminate weeds. For example, if we could always have time to prepare the seed bed, spray onto it a light application of herbicide and so obtain death of all germinating weed seeds, the problem would be simple. Then the crop could be seeded after the weeds were eliminated. With a few crops this is actually possible by using a selective herbicide.

In the case of soybeans, we decided to select compounds that could be used in a pre-emergence way, that is, sprayed on the seed bed after the beans were sown, which would control most of the weeds and yet not damage the germinating soybeans. With this in mind the following experiments were carried out on 1-square-rod plots. The soil was a finely worked silt loam. The beans were seeded on June 6, 1950, and the chemicals applied the same day. The plan and results of the experiment were as shown in the table on the next page.

### Results

In this test only sodium pentachlorophenol adequately killed a large proportion of the weeds without seriously damaging the beans. This herbicide at the two higher



**PRE-EMERGENCE EFFECTS OF VARIOUS HERBICIDES  
ON SOYBEANS AND WEEDS**

Plot	Herbicide Applied	Rate of Application per acre	Vol. Rate of Spray Applied Gal./Acre	% Weed Control	% Damage to Beans
1	Xanthogen disulfide	1 gal. <sup>1</sup>	160	0	0
2	Xanthogen disulfide	2 gal.	160	0	0
3	Xanthogen disulfide	3 gal.	160	0	0
4	Commercial pentachlorophenol (3% PCP)	5 gal. <sup>2</sup>	160	25	0
5	Commercial pentachlorophenol (3% PCP)	10 gal.	160	50	0
6	Commercial pentachlorophenol (3% PCP)	15 gal.	160	50	0
7	Sodium pentachlorophenol	10 lb.	160	75	0
8	Sodium pentachlorophenol	15 lb.	160	95	0
9	Sodium pentachlorophenol	20 lb.	160	100	0
10	NaTCA 90%	5 lb.	160	75	60
11	NaTCA 90%	10 lb.	160	75	80
12	NaTCA 90%	15 lb.	160	75	90
13	TCA Ester	0.5 gal. <sup>2</sup>	160	0	10
14	TCA Ester	1 gal.	160	25	40
15	TCA Ester	1½ gal.	160	25	50
16	Xanthogen disulfide	1 gal. <sup>1</sup>	160	25	25
	TCA ester	1 lb. )			

Chemicals applied by a knapsack spray — No. 8002 nozzle.

<sup>1</sup> 1 gal. contains 5 lb. Xanthogen disulfide.

<sup>2</sup> 1 gal. contains 10 lb. TCA.

rates controlled 95-100 percent of the weeds, and in addition caused little or no damage to the beans even at the 20-pound-per-acre rate. At 10 pounds per acre the weed control was estimated to be 75 percent. In this case most of the broad-leaved weeds were eliminated, but not all the grasses. The TCA effectively eliminated practically all the weeds, but also seriously stunted all the beans. At the 15-pound-per-acre rate, the beans were still only 3 inches in height after 6 weeks' growth, and it was apparent that while not killed outright, they would never attain any size. Xanthogen disulfide and commercial pentachlorophenol did not damage the beans, but also gave poor weed control at the rates used.

This same experiment was repeated later during a 5-week dry period. Ninety percent of the beans did not germinate and emerge until 1 month after the seeding date. In this case the chemicals had again been applied the same day as the beans were seeded. However, after the 30-day period of little or no growth, none of the chemicals were effective as they had apparently been dissipated. One naturally asks what became of the compounds as no rain fell to leach them away. We can only theorize, but we do know that soil micro-organisms (bacteria, fungi, and particularly actinomycetes) remain active even in fairly dry soils and the probability is that the herbicides were largely broken down and decomposed before germination of the beans and weed seeds took place.

In ordinary spring plantings the above situation would not be likely to occur, but it is mentioned here as an example of a situation that occasionally can result in failure and actually no blame can be attached to anyone except the weather man.

### Harvest Drying

This action is often erroneously referred to as defoliation. Actually in artificially or chemically drying beans for harvesting, more than defoliation is needed. In this case a duplication of the effect of a rather severe early frost is the desirable answer. Ordinarily, a farmer has to wait for a frost to accomplish this task. This, however, has several disadvantages. Very often the beans ripen unevenly and the more mature drier pods shatter resulting in loss of beans. Secondly, quite often frosts occur too late in the season to allow a farmer to take advantage of higher prices that often prevail earlier in the season.

On the other hand, harvesting the beans

before the foliage is dry is attended by several difficulties. First, the green seeds go into the hopper along with the mature dry seeds and raise the moisture content to undesirable levels. (These green beans, sometimes referred to as "roasting ear beans" dry rapidly when the beans are treated with chemical and become an asset instead of a hazard.) Also, large quantities of green vegetation cannot be easily combined as the machine is not designed to handle such material. The presence of green weeds amplifies the trouble. In addition, if the pod is not brittle and dry, yields are materially reduced as the pods do not shatter and release the beans in all cases.

The problem then was to find a cheap controllable duplication for early frost. In some large local experiments on Valley Farms Inc., at Carrollton, Ill., it was learned that low volume sprays of pentachlorophenol and oil did a very satisfactory job of drying beans for harvesting. As soon as the bean pods are losing their green color (at which time the beans will be separating in the pod), the chemical is applied by airplane. Last year's tests indicated that the beans can be harvested in from 4 to 5 days after treatment. However, in some cases, depending on weather conditions, drying was completed in 48 hours.

The tests consisted of pentachlorophenol formulations applied by plane at 2, 4 and 6 gallons per acre. Actually, very little difference could be seen between the 2 and 6 gallon rates except where a great many green weeds were present. In such cases, 4 gallons or more were necessary, particularly if the weeds were predominantly grasses. Generally speaking, between 2 and 3 gallons per acre is adequate.

Several beneficial results were noted from the Carrollton tests. In all cases (rain not intervening) 4 days after spraying, soybeans had begun to drop their leaves and were dried until the moisture content was under 14 percent; grasses had dried enough that they did not materially hinder combining operations—other weeds were so dry and brittle as to be hardly noticeable. Also, the chemical treatment killed large numbers of weeds that would otherwise have gone to seed at a later date. Finally, treated fields gave material yield increases. These higher yields were undoubtedly due to increased efficiency of the combining operation made possible by the chemical drying of all green foliage and to the saving effected by the prevention of shattering losses.

In one field trial, weeds were so bad as to make combining almost impossible and abandonment of the field was considered. After spraying with the pentachlorophenol oil concentrate, the weeds and beans were dried and brittle enough that little or no difficulty was experienced and a yield of 35 bushels to the acre was obtained. These trials were conducted on a large enough scale to conclusively allow observers to decide on the practicability of chemical drying. Over 500 acres were treated with such success that we may look for the practice to become standard particularly where green weeds obstruct efficient combining.

### Summary

Only a bare beginning has been made toward adapting chemicals to the weeding of soybeans. Very little is known as yet about proper timing. The effect of various soil types on pre-emergence treatments requires investigation. Of major importance would be the discovery of a chemical that would be relatively non-toxic to soybeans and yet toxic to the majority of weeds found in this crop—in other words, a good selective herbicide. In the test described in this paper, only sodium pentachlorophenol gave promising results. This chemical can only be used in a pre-emergence way as its phytotoxicity would destroy the beans if applied directly to the bean plants.

As far as harvest drying is concerned, the problem is less complex. No selectivity is necessary as uniform drying of all vegetation is desirable. Considerable progress has been made in one season as just described. Further study may reveal cheaper chemicals that are water soluble or more easily formulated. Undoubtedly several refinements will take place regarding combinations of chemicals and such items as rates, methods of application, and adaptations to fields too small to warrant airplane applications. Also, with further development of early varieties combined with harvest drying, it should be possible for farmers to harvest soybeans early enough to allow them to utilize the land for winter wheat or some other similar crop.

R. E. CARLYLE





# WHAT DETERMINES SOYBEAN PRICES?

G. L. JORDAN

Professor, Department of Agricultural Economics, College of Agriculture, University of Illinois, Urbana, Ill.

THE PRICE which the farmer receives for soybeans in peace times is determined by several factors including:

- 1—The price users will pay processors for soybean oil.
- 2—The price users will pay processors for soybean meal.
- 3—The processing margin or the amount that processors are able to obtain for their services, and
- 4—Transportation and other handling costs on beans and products.

This analysis assumes no effective price supports and no effective price ceilings.

## Soybean Meal Prices

We recognize that the demand for meal is derived from the demand for meats and livestock products for the production of which the meal is used, and that the demand for oil is derived from the demand for margarine and shortenings.

The principal use of soybean meal is for protein supplements for livestock feeding but other protein supplements are available for the same use. Therefore, we take into account the total quantity of oilseed meals and animal protein supplements available. The relationships between the price of corn and the price of supplements also affect feeders' willingness to buy supplements. This price relationship is affected by the quantity of corn available as well as by the quantity of protein supplements available. So we consider the size of the corn supply. The demand for protein supplements is also affected by the number of grain consuming livestock to be fed.

In our analysis of the factors affecting soybean meal prices, after trying several combinations, we obtained a reasonably high correlation between actual prices and computed prices of the protein supplements

combined for the periods 1935-1936 to 1941-1942 and 1946-1947 to 1948-1949 by using disposable personal income,<sup>2</sup> the production of protein supplements (meal equivalent) per grain consuming animal unit (except horses and mules), and the corn supply (production plus carryover) per grain consuming animal unit (except horses and mules) as the meal price determining factors.

Using this method we explained a large fraction of the year-to-year variation in the weighted average price of the protein supplements. It remained to explain the variations between price changes of soybean meal and the price changes of the composite protein supplement used. Actually the price of 41 percent soybean meal at Chicago varied less than 2 dollars a ton from the computed weighted composite price from 1939-1940 to 1948-1949.

**Interpretation of analysis.** A price (in logarithms) is read on the left hand scale of Figure 1 that corresponds with the anticipated disposable personal income (also converted to logarithms). Let us say that disposable income is expected to be 200 billion dollars. The logarithm on the lower horizontal scale is 2.30. The logarithm of price that corresponds to that (intersection of diagonal and vertical lines) is 1.992 (or \$98.18). If we assume that protein supplement supplies are equal to 1948-1949 supplies (.0636 tons per grain consuming animal unit) we deduct .064, the vertical distance from the diagonal line to the zero line in Figure 2 from our original logarithmic value of 1.992. This leaves 1.928 (or \$84.72). If now we assume a bumper crop of corn or 25 bushels per animal unit we de-

duct .045 from the 1.928 leaving a logarithmic value of 1.883 (or \$76.38) as the estimated composite price of all protein supplements when converted to a meal equivalent basis.

The slope of the line in Figure 1 indicates that a rise or fall of .100 in terms of logarithms of disposable personal income (in billions of dollars) was associated with a rise or fall in the same direction of about .119 in terms of logarithms of prices of protein supplements (in dollars per ton). That means that for every 1 percent rise in disposable personal income the price of protein supplements combined (meal equivalent basis), weighted according to their actual production, rose almost 1.2 percent. The declines were in the same proportion.

In Figure 2 the portions of the prices that are not explained by the size of disposable personal income (the vertical differences between the plotted values and the corresponding values on the diagonal line in Figure 1) are compared to the production of protein supplements (changed to the meal equivalent). This chart indicates that as the quantity of protein supplements (meal equivalent) increases 1 percent the price of protein supplements (meal equivalent basis), weighted according to their actual production, declined approximately .43 percent. The influence of changes in protein production was about one-third as large as the influence of equal percentage changes in disposable personal incomes on changes in prices of protein supplements.

In Figure 3 the unexplained portion of prices (measured as vertical distances between the actual points on Figure 2 and corresponding values on the diagonal line) is correlated with corn supply per grain-consuming animal unit (except horses and mules). The price residuals are in logarithms but the corn supply is in bushels. In this case an increase in the corn supply

Figure 1. Relation Between Disposable Personal Income, United States, and Composite Price of Protein Supplements, Meal Equivalent Basis, 1935-36 to 1948-49.

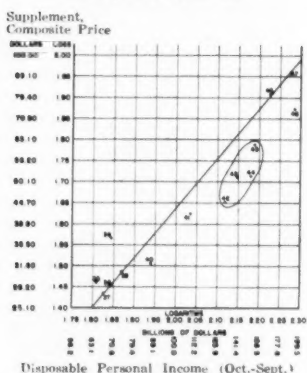
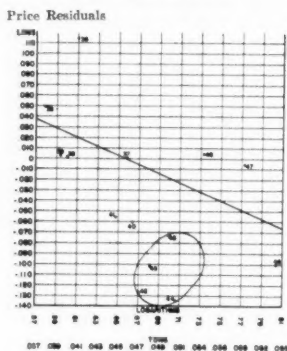
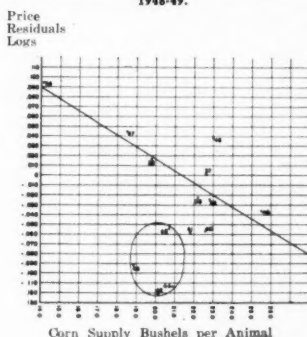


Figure 2. Relation Between Composite Prices of Protein Supplements and Supplies of Protein Supplements, Meal Equivalent Basis, per Grain Consuming Animal Unit, Except Horses and Mules, 1935-36 to 1948-49.



Quantity of Protein Supplements, Meal Equivalent Basis, per Grain Consuming Animal Unit Except Horses and Mules

Figure 3. Relation Between Composite Prices of Protein Supplements and Corn Supply per Grain Consuming Animal unit, 1935-36 to 1948-49.



of 1 bushel per animal unit was associated with a decline in the price of protein supplements of approximately 2.5 percent.

In estimating the probable price of soybean meal we would use the estimated price of protein supplements from the charts. Because of the dominant position now occupied by soybean meal as far as supplies of supplements is concerned the composite price and the soybean meal price will agree rather closely.

It appears that soybean meal production has about reached its maximum peacetime percentage of total supplement production; hence, the present relationship between prices of soybean meal and the composite price should continue.

Drouths or peaks or troughs in the livestock cycles (hence in tannage and meat scrap production) could cause some slight variations. If we have reached a stabilized relationship between soybean meal prices and the composite price, we can use the formula to estimate soybean meal prices directly.

### Soybean Oil Prices

The price of soybean oil is closely related to the price of competing edible fats and oils. The prices of all edible oils and fats, in combination, are determined largely by the size of the disposable personal incomes of people in the United States and by the size of the supply of edible fats and oils in the United States (The supplies available for use include production, carryover from the previous crop year, and imports.)

In this analysis we omitted the war years during which prices were controlled. For the period 1929-1930 to 1941-1942 and 1946-1947 to 1948-1949 we found that the composite price<sup>3</sup> of soybean oil, cottonseed oil, lard and butterfat, all weighted by their supplies, rose 10.1 percent with every rise of 10.0 percent in disposable personal income<sup>4</sup> in the United States, for all practical purposes a one to one relationship. (Figure 4.)

After correcting for changes in United States consumers' ability to buy—changes in their disposable personal income—it was found that the composite price of these four fats and oils declined 14.43 percent

with every 10 percent increase in supplies of the four fats and oils in the United States. (Figure 5.)

Prices of edible fats and oils are sensitive to changes in both demand and supply. These two factors appeared to account for about 95 percent of the year to year fluctuations in the composite price.

In recent years soybean oil prices averaged approximately 55 percent of the composite price. If, compared to the most recent 5-year average, the supplies of soybean oil plus cottonseed oil increase much more or decrease much less than the supplies of lard plus butterfat, soybean oil prices will be more nearly 50 percent of the composite price. With opposite supply relationships soybean oil prices may go as high as 60 percent of the composite price. In 1948-1949 soybean oil supplies plus cottonseed oil supplies made up 50.6 percent of supplies of the four edible fats and oils. Soybean oil prices were 52.8 percent of the composite price. In 1947-1948 the comparable figures were 48.0 and 63.4. In 1946-1947 they were 44.0 and 61.3.

For forecasting purposes it would be necessary to estimate carryovers and production of all four edible fats and oils. Some knowledge of probable imports would help but for these four edible fats and oils imports are not important. Imports of other fats and oils would affect the price of soybean oil but that influence has been ignored in this study. Presumably the influence is not great under present-day (1950) conditions. It would also be necessary to estimate the level of disposable personal income. The latter estimates are made from time to time by agencies of the government and by private agencies.

### Relationship

Soybeans are worth the value of the oil and meal less all transportation, handling, and processing costs from the local bean market until the oil and meal are processed and sold by the processor.

For the period studied, excluding the war years, the processing margin has tended to fluctuate around a figure equal to 25 cents plus 25 percent of the value of the meal and oil combined as used in this analysis minus 2 cents a year beginning with



G. L. JORDAN

1935-1936 as year one and counting the war years<sup>5</sup>. The agreement between actual margins and margins estimated by this formula was fairly close. There appears to be a gradual decline in margins compared to actual values of the products. We represent this decline by subtracting a value that increases 2 cents a year beginning with 1935-1936 as year one. There also seems to be a base below which margins do not fall. We used a base of 25 cents. There also appears to be some adjustment for changes in costs of handling and processing caused by inflation or deflation which we account for by using 25 percent of the combined value of the products.

The soybean processing industry is in a dynamic stage of development so the factors affecting margins should be reviewed frequently. The windfall profits (or losses) resulting from rapid changes in prices of the products after harvest are received by the owners of the product. If the farmers sell their beans at harvest time and the processors sell the meal and oil for future delivery to actual users, then the product users make the gains or losses.

### Seasonal Pattern

For the period 1930-1931 to 1940-1941 the lowest prices received by Illinois (and United States) farmers for soybeans tended to be in October. The highest prices were in May and June. The monthly figures as percentage of the average yearly price after adjustments for changes in demand and year-to-year changes in supplies were as follows: October 82; November 89; December 96; January 102; February 103; March 107; April 110; May 115; June 114; July 105; August 90; and September 88.

Figure 4. Relation Between the Composite Price of Four Edible Fats and Oils and Disposable Personal Income, United States, 1929-30 to 1948-49.

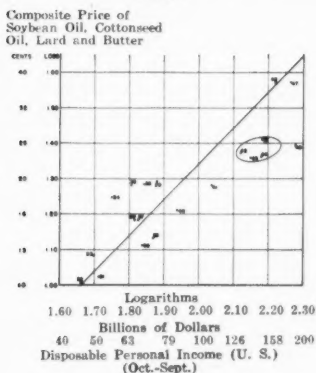
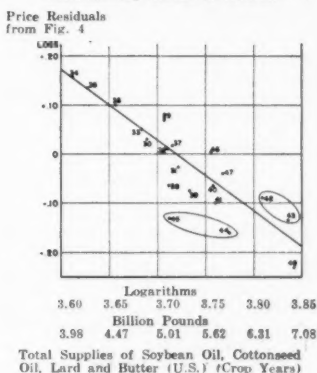


Figure 5. Relation Between the Composite Price of Four Edible Fats and Oils and Total Supplies of Soybean Oil, Cottonseed Oil, Lard and Butterfat, 1929-30 to 1948-49.



## Application of Formulas to 1950-51 Soybean Prices

We can apply the formulas to estimate 1950-51 prices of soybeans if we can estimate the size of the factors used. Of course, we are aware of the possibilities of price ceilings. They probably will not be below parity and parity prices are calculated by the U. S. Department of Agriculture using a published formula. We shall assume, for illustrative purposes, no price ceilings or supports and the following demand and supply conditions (they are my guesses as to what is likely to happen):

Disposable personal income, 195 billion dollars  
Quantity of protein supplements, meal equivalent (oilseed meals, gluten feed and animal protein only), 9.25 million tons  
Grain consuming animal units, except horses and mules, 156 million  
Corn supplies, 4,025 million bushels  
Supplies of four edible fats and oils, 7.7 billion pounds  
Calculated monthly average price of meal (unweighted), \$75 to \$77  
Calculated yearly average price of soybean oil (55 percent of composite price of four edible fats and oils), \$14 to \$15 a pound  
Calculated value of products (meal plus oil), \$3.20 to \$3.40  
Calculated Illinois farm price of soybeans (weighted), \$2.50 to \$2.60

The above formulas and calculations apply to peacetime conditions. They would apply to the 1950-51 situation only if the war is confined to Korea and the fear of scarcity or further inflation dies down.

This pattern has changed as production has increased and marketing procedures have changed. From 1931-1932 to 1935-1936 the October low was about 78 from which there was a steep rise to about 122 in June. July was only a little lower than June. After July there was a very rapid decline. From 1936-1937 to 1940-1941 the seasonal fluctuations were somewhat less pronounced and the peak was reached earlier in the season. The October price was about 85 percent of the crop-year average and the peak was reached in May at approximately 114 percent of the yearly average. No consideration is given to the war years because the OPA did not permit the usual forces to operate and little seasonal variation occurred. Since abandonment of price ceilings the price movements have been erratic but the amount of seasonal spread has been about the same percentage as in the 1936-1937 to 1940-1941 period. The timing of the peak in prices appears to have advanced a little to April or May and a larger fraction of the rise occurred by January than was true before the war.

The postwar seasonal pattern would be approximately as follows: October 85; November 100; December 100; January 105; February 100; March 110; April 114; May 105; June 105; July 102; August 92; September 82. *The heavy penalty on October sellers has persisted into the postwar period.* There may be some tendency to return to prewar seasonal patterns so I shall average the figures for the two periods. That gives us:

October	84	April	112
November	94	May	110
December	98	June	109
January	103	July	103
February	102	August	91
March	108	September	85

Professor Hieronymus and I have published material explaining the reasons for this very large seasonal price spread.<sup>4</sup> We believe that it is related to and largely caused by the heavy marketings by farmers at harvest time combined with the inability of processors to hedge their purchases to ad-

vantage in the futures markets. Processors have been obliged to carry the price risk, which they are not prepared to do, or to sell oil and meal to actual users for later delivery. These users have demanded and obtained substantial price concessions for carrying the risk. The seasonal movements of soybean meal and soybean oil prices have been small compared to the seasonal movements of soybean prices.

The farmer is in a better position than the processor to carry this seasonal price risk and should store more beans on the farm rather than sell such a large fraction at harvest time. Unless interfered with because of war influences it would seem that increased participation in the soybean futures market, particularly by speculators who are willing to buy when processors wish to sell and vice versa, will facilitate hedging by processors and thereby reduce the seasonal price spread. More farm storage would have the same effect.

But for the next few years the forces which have caused this wide seasonal spread will continue to operate in the absence of government price controls such as price ceilings or price supports above the freely competitive market price. It should be emphasized that we refer to seasonal price movements after the influence of changes in demand have been eliminated. A rise in demand for meal or oil would cause prices to rise more than seasonally or fall less than seasonally and a decline in demand would have the opposite effect.

## Summary

Prices received by farmers depend on the prices that consumers will pay for meat and other animal products, margarine and vegetable shortenings, the size of the livestock population, the supplies of protein supplements, the supplies of corn and edible oils, and the costs and profits of handlers, transportation agencies and processors. The dominant influence is the ability of the United States consumer to buy. We measured that ability by the size of personal

incomes after taxes. But supplies are also important.

In the absence of price ceilings or effective price supports prices of soybean meal can be expected to change about 1.2 times as much (in percentage) and in the same direction as disposable consumer's income during the next few years. Meal prices can be expected to move in the opposite direction to changes in supplies of the supplements used in this study (converted to a meal equivalent basis) and about .40 to .45 as much (in percentage). An increase of 1 bushel per animal unit in the corn supply would tend to drive down the price of meal about 2.5 percent. The actual price will be about the same as the weighted composite price of all supplements converted to meal equivalent.

In the absence of price controls or effective price supports soybean oil prices will change in the same direction and about the same percentage as disposable personal incomes change. They will also tend to change in the opposite direction about 1.4 to 1.5 percent with every 1 percent change in supplies of the four edible fats and oils—soybean oil, cottonseed oil, lard and butterfat. The actual price of soybean oil will approximate 55 percent of the weighted composite price of the four edible fats and oils.

From the combined value of the oil and meal must be deducted marketing and processing costs. These fluctuate rather widely if assumption of risk by users of meal and oil is included as a marketing cost. It appeared that these deductions were becoming somewhat stabilized around a figure equal to 25 cents a bushel plus 25 percent of the value of the meal and oil minus 2 cents for every year since 1934-1935 (cumulative).

As soybean production expanded rapidly and the market became a little better organized the seasonal spread in soybean prices from the October low to early summer high declined somewhat. The October price continues to be very low as a percentage of the yearly average price (after corrections for changes in demand and production) but the peak comes sooner—in April or May—and much of the rise occurs by January. More farm storage until January or May will probably pay growers for several years unless we get into a period of price controls. In case of controls some consideration will have to be given to the matter of orderly marketing, either by allowing seasonal variations in prices or by paying farmers or others a fee for storing.

<sup>1</sup> We did not use wheat-milling by-products. We used soybean meal, cottonseed meal, linseed meal, copra meal, peanut meal, gluten feed and meal, tankage, meat scraps and fish meal.

<sup>2</sup> Disposable personal income was used from October to September to correspond with the crop year. Prior to 1939 annual calendar year data were interpolated.

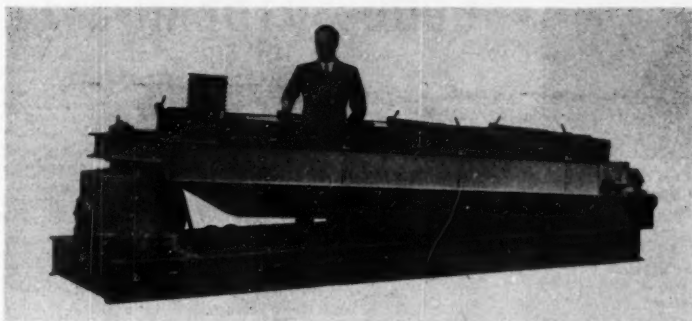
<sup>3</sup> The composite price was obtained by using crop year prices multiplied by crop year production plus carryover for the crop year or Jan. 1 and imports for the ensuing calendar year.

<sup>4</sup> Disposable personal income was used from October to September to correspond with the crop year. Prior to 1939 annual calendar year data were interpolated.

<sup>5</sup> Hieronymus, T. A. and Jordan, G. L., Farm Storage of Soybeans Carries Small Price Risk. Illinois Farm Economics, University of Illinois, Oct. 1949. Reprinted in the Soybean Digest, Jan. 1950.

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<sup>\*</sup>Trade Mark Reg.

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Figure 1. Circular metal bin on crushed rock foundation. These bins provide satisfactory storage if all joints and bolts are well sealed.

**B**EFORE DISCUSSING this question it might be well to ask "Why is farm storage needed for soybeans?" Modern harvesting with combines is done so rapidly that soybeans accumulate in a hurry and millions of bushels move to market in a short time. Commercial storage facilities are taxed to the limit and prices often suffer because of this.

It has been said that no system of marketing where much of the crop is dumped on the market in a short time will ever yield the maximum return to the grower. If enough farm storage becomes available more uniform marketing throughout the year will be possible. Government loan programs for soybeans also provide an incentive to provide more farm storage.

Comprehensive research work on the problems of storing soybeans on the farm has been conducted in Illinois by the United States Department of Agriculture and the Illinois Agricultural Experiment Station. Over 76,000 bushels of soybeans with different moisture contents were used in the studies. Some 60 bins of various sizes, shapes, materials, and types of construction were used in the storage work.

This research work, and other studies, have shown the main problems connected with good storage to be:

- 1—Buildings or bins that are structurally sound and weathertight.
- 2—Soybean moisture limits for safe storage for varying lengths of time.
- 3—Grain insects and their control.
- 4—Mechanical drying of soybeans too wet for safe storage.

### Building for Good Storage

Soybeans deserve as good storage as any other crop on the farm. The basic requirements for a good storage building are:

- 1—It must be structurally sound—that is the floors must be strong enough to support the weight of soybeans and the walls must withstand the lateral or outward pressures exerted by the grain. Bins which will hold shelled corn or wheat will be strong enough

Principal results reported in this paper were derived from cooperative research conducted jointly by the Bureau of Plant Industry, Soils and Agricultural Engineering, Illinois Agricultural Experiment Station, departments of agronomy and agricultural engineering, and the Illinois Natural History Survey.

# What Is GOOD SOYBEAN STORAGE?

By LEO E. HOLMAN

Agricultural Engineer, Bureau of Plant Industry, Soils, and Agricultural Engineering, Agricultural Research Administration, U. S. Department of Agriculture

for soybeans. Bins only strong enough for oats cannot be safely filled to capacity with soybeans.

2—The bin must be weathertight—that is, it must exclude rain, snow and ground moisture. In the soybeans storage research work weathertightness was found to be more important than bin size, shape or color. Some wet spoiled grain was found in all single-walled, wood-framed bins although they appeared to be reasonably tight. Moisture entered through cracks in the siding or between the siding boards or in the siding joints.

Exterior plywood sheets, of sufficient strength, nailed to the outside of the studs make a weathertight bin wall if all joints between sheets are sealed. A good weathertight wood wall can be made with two thicknesses of material on the outside of the stud, a layer of waterproof paper between, and no lining inside the studs.

There are a number of circular metal bins (Figure 1) on the market, but these are not entirely weathertight unless a thorough job of caulking is done at wall joints and around bolts.

Naturally the roof must be weathertight, and even small leaks that would cause no trouble in a corn crib may cause considerable damage in stored soybeans.

There are other features too which are important although they do not affect the quality of the grain—for example, construction costs and convenience of filling and emptying.

### Moisture Limits

The moisture content of soybeans is the most important factor in good soybean storage. Soybeans stored dry and kept dry signify good storage. In the storage studies high grain moistures were found to be responsible for most storage troubles. This was true whether the soybeans were damp when stored or they became damp because the bins were not weathertight.

Soybeans, being an oilseed, must be drier than corn or wheat to store safely under similar conditions. For example, where corn or wheat stores satisfactorily at 13 percent moisture, soybeans should be down to around 11 percent. If the moisture is uneven because of combining too early in the morning, or too soon after a rain, the highest moisture should be down to the safe limit and not just the average moisture. The safe storage period will depend on the

highest moisture instead of the average for the bin.

In the storage studies it was found that soybeans with different moisture contents could be stored safely at Urbana, Ill., for these lengths of time:

1—14 to 15 percent moisture. There was little damage through late fall and winter but deterioration increased rapidly with the arrival of warm weather in the spring.

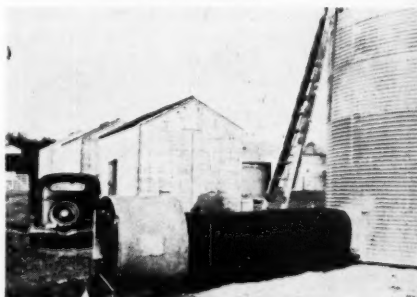
2—13 percent moisture. There was little change in grade from January to January, but the acid number of the oil increased and the germination decreased to nearly zero.

3—12 percent moisture. Quality was maintained for nearly 3 years, but deterioration was pronounced after that time.

4—9 percent moisture. There was no significant change in grade or quality after 4 years in storage. Germination held up well for more than 1 year.

Comparisons were made of changes in fat acidity, a chemical test for quality changes, and germination in soybeans stored with different moisture contents in identical bins. After 650 days storage there was little change in soybeans stored with 9 percent moisture. Changes were more pronounced in soybeans with 12 percent though the grade did not change. In the lot stored at 13.5 percent moisture the fat acidity had increased to 46 units and the germination

Figure 2. Bin type grain drier. Air from the gasoline engine driven fan is blown into the bin under a perforated floor, then forced upward through the floor and through the grain. Other types of fans or forced-air heating units can be used with this bin drier or with other batch type or continuous driers. The fan and heater must have sufficient capacity to do a satisfactory job of drying.



SOYBEAN DIGEST



decreased to nearly zero. This indicated severe deterioration which was also shown by the grade.

Grain temperatures have not been a problem in central Illinois where soybeans have been stored with moistures of 12 percent or below. Low temperatures are desirable even in the storage of dry soybeans as germination losses and insect populations will be reduced and fat acidity will not increase as fast. The grain temperature will depend mostly upon the climate of the region as it is generally not practical to use artificial methods of lowering temperatures of grain held for commercial sale.

The variations of soybean temperatures within the bin have more effect than high air temperatures on how well soybeans store. Temperatures in the center of the bin have been found to be as much as 20° to 30° higher than those near the walls or surface of the bin during the fall or early winter. These temperature differences cause a convection movement of the air within the grain where cool air moves down the walls, then toward the bin center where it is warmed and then upward toward the surface. Some water vapor is carried from the warmer grain to the cooler upward layers where it condenses. Vapor migration is sometimes responsible for moisture increases ranging up to 10 or 15 percent in the surface layers near the bin center. Fortunately this increase is mainly confined to the bin center and does not extend nearly to the walls.

Generally the accumulation of moisture resulting from moisture migration does not affect any large volume of grain in a bin unless the average moisture content is 13 percent or above. Stirring the surface of the grain during late fall and winter helps to break up high moisture areas and prevent spoilage. Cold winter air pulled downward through the central part of the bin helps to equalize grain temperatures and stop the convection air currents. To do this air ducts must be installed before the bin is filled and equipment provided for pulling the air through the grain.

It is better to have soybeans dry enough so that moisture migration will not be a serious problem. Soybeans stored with moistures of 12 percent or lower gave no trouble in the storage studies at the University of Illinois.

### Insect Control

Soybeans stored in farm-type bins rarely become seriously infested with insects. Occasionally small infestations of bran beetles may occur in high-moisture soybeans. If serious infestation should develop, the soybeans can be fumigated in the same manner and with the same dosages recommended for small grains.

### Drying Soybeans

Few soybeans have been fan dried on the farm so far but it is a practice that has much merit. The same facilities can be used as for corn, oats, wheat and hay. Generally, soybeans are dry enough at harvest time, but there are times when they are not. A late, wet fall may keep them too wet for storage, or even for marketing, and artificial drying can be used to good advantage. Often soybeans that are ripe and dry during the day may be too wet to

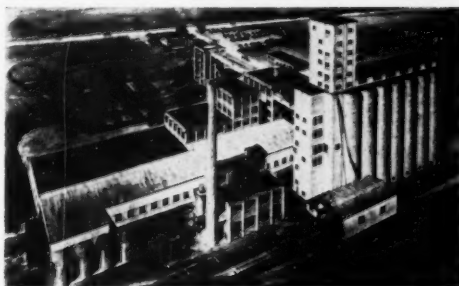
harvest in the morning and evening because of heavy dews. A drier used for drying the last load at night or the first load or so in the morning will ensure good dry grain that will be better for storage or marketing.

Drying may be done with unheated or heated air. Fan drying with unheated air depends on atmospheric temperature and humidity but is satisfactory under favorable atmospheric conditions. Drying will be slow at best and will extend over a considerable period of time. Fan drying with heated air has the advantage that it can be done at any time, day or night, rain or shine. It has been done by elevators and hybrid seed growers for a number of years. There are now a number of portable, forced-

air heating units on the market that are suitable for farm use. Several companies are now building continuous-flow driers for farm use which are similar to those used in elevators. Bin or batch type driers (Figure 2) can also be used where the grain is held in the drier until dried and cooled and then may be stored in the same structure or moved to another bin.

Soybeans with 17 to 19 percent moisture were dried down to 12 percent in drying tests at a cost of from 1 to 3 cents a bushel for fuel and power. Temperatures up to 130° were used in drying soybeans intended for commercial sale. Where soybeans are to be dried for seed the drying temperature should not be over 100 to 110° or the germination may be injured.

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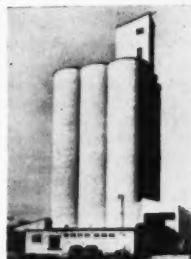
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DIVISION OF THE BORDEN COMPANY WATERLOO, IOWA

# SOYBEAN HARVESTING LOSSES

By JAY G. PORTERFIELD

Assistant Professor, Department of Agricultural Engineering, Iowa State College

**M**OST PEOPLE aren't in the habit of paying for an 80 cent item with a dollar bill and leaving the change on the counter. That wouldn't be good business. Neither is it good business to prepare a good seedbed, plant quality seed and cultivate the crop, only to do a poor job of harvesting by leaving 15 to 20 percent of the crop in the field. By salvaging most of this loss a marginal operation may be turned into a profitable operation or the profit may be increased. In order to do a better, more efficient harvesting operation the combine operator must know where the soybeans are being lost, what causes these losses and how they may be reduced.

Consider a field of mature soybeans ready for harvest. What are the chances of getting every bushel of soybeans from the standing stalk into the storage bin? Let's look at various losses and see what causes them and how they may be reduced.

## Shatter Losses

Shatter losses are defined as those losses which occur before the combine has pulled into the field. They are characterized by single soybeans on the ground or by pods containing soybeans lying on the ground. These losses cannot be justifiably charged to poor combine adjustment. Shatter losses may be caused by late harvesting, adverse weather or a difference in variety of soybeans. If soybeans remain standing in the field after they are completely matured there is bound to be some shatter loss. The longer harvest is put off after maturity the greater this loss will be. Harvesting soybeans at the proper time is largely a management problem that can be controlled by the individual operator.

Adverse weather and strong wind also cause shatter losses. It was interesting to note last fall while walking through plots of Lincoln soybeans that had been severely damaged by wind that very few loose beans were lying on the ground. Practically all beans blown off the stalk were still in the pod. Little can be done to control the weather and wind so this cause of shatter loss will probably always be with us.

Different varieties show varying tendencies to shatter. Have you ever walked into a soybean field on a hot dry day and heard the soybeans popping open and seen the beans scattered over the ground? A definite reduction in shatter losses may be had by planting soybeans adapted to combine harvesting. Those varieties which stand straight, ripen uniformly and show little tendency to shatter on maturity are most desirable.

Tests conducted by the Iowa Experiment Station under average harvesting conditions gave shattering losses ranging from 0.03

bushels per acre to 2.90 bushels per acre. The average for 12 tests was 1.10 bushels per acre or 3.35 percent of the gross crop.

## Cutterbar Losses

Cutterbar losses are those soybeans remaining on the stubble after the cutterbar has passed over, those shelled out of the pod by the action of the reel or cutterbar, those cut stalks which fall on the ground instead of going into the combine and filled pods dropped to the ground due to action of the cutterbar or reel. In general the losses from the cutterbar and reel are the largest losses incurred in harvesting soybeans. It naturally follows that the largest saving can be made by close attention to the factors causing cutterbar loss.

The purpose of the combine reel is to assist in getting the cut soybean stalk started uniformly into the cylinder feed. This should be accomplished with as gentle handling as possible. The speed of the reel (which is adjustable on many combines) should be equal to or a little faster than the forward speed of the combine. An excessively high reel speed will result in a greater number of shelled soybeans falling on the ground.

The reel on most combines is adjustable for height relative to the cutterbar and may be placed in several positions forward of the cutterbar. For average harvesting conditions the reel should be set at a height to strike the stalk to be cut above the middle. The reel should be parallel to the cutterbar and a little ahead of it. These adjustments may be changed for varying harvesting conditions in order for the reel to perform its primary function in the best possible manner. Solid reel bats extending from the center of the reel to the perimeter have given a lower loss than the standard reel.

The condition of the cutterbar has an effect on the size of the cutterbar losses. Dull sickle knives, poor register or worn ledger plates which give a tearing or breaking action tend to increase the shelling of soybeans. A clean cut with a minimum jar to the mature soybean stalk will reduce the cutterbar loss.

One of the most important contributors to large cutterbar losses is the height at which the cutterbar is set. Practically all combines have cutterbars which are adjustable for various heights of cut. Tests were conducted at the Iowa Experiment Station to determine the effect of cutterbar height on losses when the height of cut was progressively increased from 1 inch to 16 inches. The cutterbar losses increased at the rate of 1.4 bushels per acre for each inch of height above the ground. This represents a loss of 3.6 percent of the gross yield for each inch increase in cutterbar height. Not only are soybean pods left on the stubble with a high cutterbar, but also if the cutterbar is in the fruiting zone of the plant many pods are cut in two making an additional loss. To minimize this loss the cutterbar should be operated as low as is consistent with the terrain, the lower fruiting height of the plants and the cultivation of the field.

Cultivation practices may have an effect on the magnitude of the cutterbar losses. Measurements by A. C. Everett at the Iowa Experiment Station showed that where no lodging occurred, ridge type cultivation gave less cutterbar loss than flat cultivation. In comparing hand, gauge wheel or hydraulic control of the cutterbar, gauge wheels gave the lowest loss on flat cultivation. Hand control and gauge wheels gave about equal results on ridge cultivation, and both were better than hydraulic control of the cutterbar.

## SOYBEAN HARVESTING LOSSES

IN

### AVERAGE HARVESTING CONDITIONS

	Bushels per Acre	Percent of Gross Yield
Shatter .....	1.11	3.35
Cutterbar .....	3.90	11.78
Threshing .....	0.21	0.63
Separating .....	0.32	0.97
Net Yield .....	27.60	83.38
Gross Yield .....	33.10	100.00

Tests under average harvesting conditions with average cutterbar height gave total cutterbar and reel losses ranging from 1.3 bushels per acre to 7.0 bushels per acre. The average for 12 tests was 3.9 bushels per acre or 11.8 percent of the gross crop.

### Cylinder Losses

I am frequently asked how much threshing effect or shelling effect is required for soybeans. The answer I usually give is "Just enough and no more." The threshing effect may be decreased by decreasing the cylinder speed, increasing the clearance between cylinder and concaves or by reducing the number of concaves. The general tendency is to overthresh. Overthreshing results in damage to the soybeans and excess power requirement. Overthreshing also breaks up the straw so much that the chaffer and strawracks may be overloaded.

Underthreshing is characterized by finding unthreshed pods being discharged over the straw racks or chaffer extension. The ideal situation would be to balance these three adjustments in such a way as to shell all soybeans out of the pod but not damage any of them. Cracked and damaged soybeans may not seem like a real loss since they do go into the bin. However, cracked and damaged soybeans do not store well, high damage will result in lower selling price and damaged soybeans are poor seed risks.

Dr. C. R. Weber of the Iowa Experiment Station found that a large soybean such as

Habaro suffered more damage from the combine cylinder than did a smaller soybean such as Chief. He also found that less damage occurred when the soybeans were from 13.5 to 10 percent moisture content. Soybeans above 14 percent moisture would present a storage problem and have lower germination. Below 10 percent moisture there would be excess damage with resulting low germination.

Under average harvesting conditions the total cylinder losses ranged from 0.0 bushels per acre to 0.7 bushels per acre. The average for twelve tests was 0.2 bushels per acre or 0.6 percent of the gross crop.

### Separating Losses

Soybeans shelled out of the pod are sometimes discharged from the rear of the combine. They may be coming out over the straw racks or over the chaffer extension. Separating losses over the strawrack are usually caused by overloaded or plugged straw racks or improper straw rack speed. Separating losses over the chaffer extension may be caused by excess wind or improper wind direction from the fan. They may be caused by insufficient opening of the chaffer or chaffer extension or by an overloaded or plugged chaffer. Improper speed on the chaffer may also cause separating losses.

Tests under average harvesting conditions gave total separating losses ranging from 0.02 bushels per acre to 1.4 bushels per

acre. The average for 12 tests was 0.3 bushels per acre or 1 percent of the gross crop.

### Cleaning Problems

Frequently an operator closes the adjustable sieve so much in an effort to clean the soybeans that too many are returned through the tailings auger for a second threshing. A high return through the tailings usually results in higher percent of cracked and damaged soybeans. This damage may be reduced by opening the sieve sufficiently to insure passage of all threshed soybeans into the clean grain auger. In fields where frost has not killed all weed growth it may be advisable to attach an extra cleaner at the grain tank to take out small weed seeds and broken weed stems. Weedy stem particles of the same size, shape and weight as soybeans are hard to remove, and if possible fields having many green weeds should be left until a killing frost. A relatively small percentage of green weed material may cause spoilage during storage.

### Conclusion

Harvesting soybeans with a combine is not an exact science, it is an art. No rule of thumb will hold true for all conditions. However, knowing the purpose of each part of the combine and making one adjustment at a time to obtain best possible performance will give good results under practically all conditions.

# SOYBEANS

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### BETTER GERMINATION

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threshed seed with cracked or thin seed coats particularly need the protection of Spergon. Ask for Spergon when you buy your inoculant; they are compatible.

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A. L. WARD

## SELLING OUR PRODUCTS

# *A Challenge —* WHAT WILL YOU DO ABOUT IT?

By A. L. WARD

Director, Educational Service, National Cottonseed Products Assn., Inc., Dallas, Tex.

The key to this advertisement is found in the second paragraph, which says:

"The main job before all of us is to make sure that we sell and feed **PLENTY OF PROTEIN**. There's 'room' in efficient rations for all of the protein we're producing, if the feed trade, educational institutions and all of us do the job of educating feeders to the need for **PLENTY OF PROTEIN** in rations."

That advertisement was published 8 years ago. But notice the similarity between the paragraph which I just quoted and the following sentences quoted from an editorial in the Soybean Digest of June 1950:

"Livestock production is expanding in the United States faster than the production of high protein feeds. . . Based on current production of other protein feeds, it would require two and one-half times as much soybean meal as is now produced to provide balanced rations for U. S. livestock. . . We've a long way to go before we reach the saturation of protein usage in livestock feeding. But the industry—and we do mean the entire soybean industry—needs an organized sales program for soybean oil meal."

The need for a wider spread use of concentrated protein is recognized. The situation is a **CHALLENGE** that can best be met by a well organized sales and educational program designed to awaken buyers to their need for protein.

If the protein producers are to measure up to the challenge resulting from increasing livestock numbers; more meat and milk at less cost; more meat and milk per capita consumption; increasing consumption of concentrated protein, we must have educational work in order to make sure that the livestock and the poultry feeders of this nation and foreign countries use an increasing annual tonnage of concentrated protein feeds intelligently and economically. The use of protein feed must make a profit for the buyer, and more and more livestock producers must be made to recognize that an adequate use of protein means more profit for the grower and feeder. The grower and feeder must realize enough profit to make the business of livestock and poultry production attractive to others. It is our job to keep livestock and poultry producers on a profitable basis.

A little while ago, I quoted a part of our own advertisement. I didn't quote all of the text. I left out a little "commercial" on the value of cottonseed meal that we slipped into it. Nor did I quote all of the editorial from the "Soybean Digest"—the fellow that wrote it got in a few plugs for soybean meal which I omitted, too.

I didn't omit these "commercials" on our respective products because they were objectionable—far from it. I strongly believe in doing everything possible to promote the merits of your own product—whether it is soybean meal or cottonseed meal. That's what we in the educational service have been trying to do for 25 years for cottonseed meal.

### Room for All

The things that I've stressed, however,—the fundamental idea that we in the educational service have been preaching for a quarter of a century—is this:

*There's a need in this country for all of the protein concentrates we can produce—and more. It's good business, good common sense for all of us to work together in educating livestock producers to feed efficiently. If we do this—do the job of selling protein as it needs to be done—we will have satisfactory markets for soybean meal, cottonseed meal and the other protein concentrates.*

*On the other hand, if we spend our time and money and salesmanship in fighting each other, we'll hurt ourselves as well as the other good protein concentrates. We'll create confusion in the minds of livestock producers—we'll hamper the development of good feeding practices—we'll jeopardize our relationships with experiment stations, agricultural colleges and other public institutions serving the livestock producers, and fail to realize the full potentiality of the protein market that is possible. Yes, we will all lose if we fight each other but we will all gain if we work constructively toward a common goal of causing livestock producers to make proper use of protein in rations.*

Mr. Strayer asked me to speak because he recognizes that our two Associations have common problems and goals—be-

**Y**OU AND I ARE competitors. For 25 years it's been my business to do everything I could to aid the use of cottonseed feed products—to encourage experiment stations to find new facts that would increase the use of cottonseed meal—to promote the use of cottonseed products in mixed feeds and on the farms and ranches.

Yes, I appear here today as a competitor who was working for cottonseed meal before there was any soybean meal volume to compete with our product. And, you may be surprised to hear me say that I believe that your competitor's activities helped to create the markets that you enjoy today—that you are selling more soybean meal because your competitors have been working for many years to build markets for protein in this country.

Having admitted that I am a competitor, I am going to ask you a question: "Would you be willing for your Soybean Association to publish an advertisement saying that cottonseed meal is a good feed?"

Before you answer "No"—let me show you an advertisement that the National Cottonseed Products Association published several years ago in feed trade papers.

As you see, this advertisement is headed—"Take it from a 'Cottonseed Meal Man' . . . Peanut Meal's Good, Too." The first paragraph says:

"There's nothing wrong with Peanut Meal, Soybean Meal, Linseed Meal or any of the other protein concentrates. They're all good feeds, just as Cottonseed Meal is. You can use any of these concentrates with confidence."



cause we have already proved that we can work together on such important matters as the removal of federal taxes on margarine—and because he feels that we can both benefit by sharing our experiences and knowledge.

The cottonseed crushing industry had a rugged road to travel in the early days of protein education. History shows how many difficulties were met when there was a strong prejudice throughout America among livestock feeders and animal husbandry educators against cottonseed meal, at that time the chief source of vegetable protein available in the United States, when the animal husbandry staff members at practically all of the experiment stations conducted feeding trials and experiments primarily to determine how little protein could be used in the rations of livestock.

Meeting that type opposition has strengthened our faith in cottonseed meal and in vegetable proteins—in fact, in all proteins—it has enriched our protein research work, it has added to our sales experience.

Why should not the cottonseed crushing industry, which also crushes soybeans, peanuts and flax in the South and Southwest and many miscellaneous vegetable oilseeds in the Far West, share its experiences with you and in turn seek a fuller knowledge of your experiences in order that the oilseed crushing industry as one strong force can move forward giving proper encouragement to vegetable protein research and make more secure our economic position as an oilseed crushing industry and gain increasing recognition on the educational and sales front and thereby enlarge our usefulness to the livestock industry and to ourselves?

## 25 Years Ago

Your situation and our common situation today are considerably different from that of the cottonseed crushing industry 25 years ago when our educational service was established. Because of the constantly enlarging cotton acreage, there was a period of great expansion in the cottonseed crushing industry. Production of cottonseed meal and cake jumped from less than half a million tons yearly, prior to 1895, to a yearly average of more than 2 million tons at the time of World War I.

That was not much tonnage compared with approximately 6 million tons of soybean and cottonseed cake and meal today, but it was far in excess of the domestic demand for vegetable protein. In fact, so far in excess that the cottonseed crushing industry looked to the foreign livestock feeders—not the American feeders—for our principal outlet for cottonseed meal as a feed product. During the first 25 years of the present century (1900-1924) 28 percent of all cottonseed meal and cake produced was exported because of the lack of a market in the United States.

Much of the cottonseed meal that could not be sold abroad went into fertilizer at a low price in this country. American feeders used only limited amounts for their livestock. Strong prejudices against cottonseed meal as a livestock feed were widespread. Experiment stations had done only a limited amount of research with cottonseed meal and much of our present knowledge of the need for protein concentrates and the value of vegetable oil meals was unknown. Linseed meal was used by the spoonful or in small cups as a tonic.

The first World War made it apparent to a few leaders of the cottonseed crushing industry that they could no longer depend on foreign countries for their feed markets. They recognized also, that cotton farmers needed livestock to balance cotton; and that the soils of cotton farms needed the fertility that could be supplied by manure from livestock fed balanced rations, including cottonseed meal and hulls. These leaders also felt the need for better public relations with cotton growers and livestock producers—for close cooperation with experiment stations, extension services, and other public and private agencies in agriculture and industry.

With these objectives in mind, leaders of the Texas Cottonseed Crushers Association in 1926 asked me to set up the educational service, to work in Texas. Within a year, the educational service program was adopted by the cottonseed crushing industry's national organization, and this work has been carried on continuously for these 25 years.

Results of organized educational work in behalf of cottonseed feed products soon were evident in the disappearance of the price spread which previously had existed

Take it from a  
"Cottonseed Meal Man" . . .

## Peanut Meal's Good, too

### TO THE FEED TRADE:

No Sir, there's nothing wrong with Peanut Meal, Soybean Meal, Linseed Meal—or any of the other protein concentrates. They're all good feeds, just as COTTONSEED MEAL is. You can use any of these concentrates with confidence.

This year, the main job before all of us is to make sure that we sell and feed PLENTY OF PROTEIN. There's "room" in efficient rations for all of the protein we're producing—if the feed trade, educational institutions and all of us do the job of educating feeders to the need for PLENTY OF PROTEIN in rations.

Naturally, we'd like to recommend COTTONSEED MEAL to you. It has feeder confidence—efficient protein plus phosphorus—and other desirable qualities that make it the choice of many experienced successful members of the Feed Trade. We hope you include lots of COTTONSEED MEAL in your feed (we know it pays)—but most of all be sure to use PLENTY OF PROTEIN, regardless of which concentrate you choose.

A. L. Ward, Educational Director

**National Cottonseed Products Ass'n**  
Incorporated

1411 Santa Fe Bldg.

Dallas, Texas

Ad plugged virtues of all meals, not just cottonseed meal.

between cottonseed meal and its chief, and favored, competitor—linseed meal. Results also were evident as American livestock feeders outbid Europeans for cottonseed products, and exports soon ceased to be of major importance as an outlet for our feeds. Our industry also quickly felt an improvement in that general atmosphere which we call "public relations"—in a friendlier, closer relationship with our suppliers of raw material, with users of our feeds, with experiment stations and other educational agencies.

Please don't misunderstand me. We did not immediately achieve all of these things. There was no smooth sailing or bed of roses for the cotton oil industry just because it established an educational service. We did not solve all our problems—nor have we solved them all yet. But, I don't believe anyone in the cottonseed crushing industry today would challenge the statement that the establishment of this program was a major milestone in the history of the industry—and that favorable results, which I have mentioned, did soon become apparent.

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**BROKERS TO THE SOYBEAN PROCESSOR**

Whatever we accomplished was gained, I am convinced, because our basic policies were sound. Some of these may be briefly summarized as:

1—To encourage the inclusion of more livestock on farms in the cotton-producing states.

2—To help farmers do a better job of farming and producing livestock.

3—To encourage the use of balanced rations which would be best for the farmer, with the inclusion of cottonseed products in these rations as a secondary objective.

4—To base all advertising and educational material on the accepted recommendations of recognized feeding authorities.

In following these feeding authorities, we always seek to help farmers and ranchmen feed economically and efficiently under their own particular situation. In many cases, farmers have home-grown grains and roughages and find it to their advantage to make an economical, efficient balanced mixture by combining these home-grown grains and roughages with a protein concentrate. Most ranchmen need only a high protein concentrate to supplement their range grass.

Others find it to their advantage to purchase formula feeds; and our industry values highly its markets in the formula feed industry, just as you do your outlets for soybean meal. Many of our association members sell formula feeds, and we often assist them in formulating these feeds.

Here, again, we believe that there is room enough for all in the American market—that sound educational work on the importance of proper feeding will enable the livestock producer to choose for himself the type of feeding that is best adapted to his needs, and that a strong educational program will result in increased sales of both protein concentrates and formula feeds. We also believe that our industry, and yours, will be better off serving all of the users of its products than if it were entirely dependent upon a single outlet with all protein processors competing for the business of this one group of buyers.

5—Another basic policy has always been to feature the merits of our own products, avoiding comparisons or reflections on the merits of other feed products, or insinuations of lack of merit of other proteins.

6—Our educational work has been concentrated largely in the area where cotton is grown, and in nearby range areas. We believe that the cotton grower needs to use cottonseed feed products, to get the feeding value for his livestock and the fertility of the manure for his soils. We also believe that it is good business for our industry to concentrate as much as possible on local markets, both from the standpoint of economical marketing and from the standpoint of good public relations.

Here are some of the ways in which we have worked to make these fundamental policies effective:

1—Every possible cooperation is given to experiment stations in research seeking to develop needed information about the value of cottonseed feed products. I cannot praise too highly the service that these institutions are rendering to livestock producers, cotton growers and our own and other branches of the feed industry.

2—Our publications based on their recommendations are issued frequently and distributed widely. Our Association members purchase these publications, at a price which covers the printing cost, and distribute them in their local area; and our office distributes them direct to those whose interest has been awakened. In all cases, the publications are supplied, without charge, to livestock producers, agricultural workers and others requesting them.

The annual "Feeding Practices" bulletin, revised and published each fall, is the best known of these publications, although there are many others. The demand for this bulletin exceeds the number we can print within the budget limitations. The bulletin is used by college animal husbandry classes, vocational agricultural classes, county agents, veterans agriculture teachers, livestock associations and many others. Because the information is based on recognized feeding principles, the bulletin is accepted as a text book and used right along with Morrison's Feeds and Feeding and other similar publications.

## FINANCING YOUR SOYBEAN INVENTORY

**BEAR IN MIND** that the orderly accumulation and distribution of your inventory of SOYBEANS—MEAL—SOYBEAN OIL—may be readily accomplished by the use of WAREHOUSE RECEIPTS issued by WILLIAM H. BANKS WAREHOUSES, INC.

Warehouse Receipts, *acceptable as collateral by your own bank*, are issued against inventory STORED RIGHT ON YOUR OWN PREMISES, without cumbersome detail.

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SAN ANTONIO, TEXAS . . . ST. LOUIS, MISSOURI



3—Our Association advertises in farm and livestock papers, chiefly those serving cotton states and adjacent territory; and furnishes our members with advertising mats for use locally. When I say cotton states, remember that includes New Mexico, Arizona and California, as well as the Old South, the Mississippi Delta, Texas and Oklahoma.

4—Newspaper articles, letters and other mailings carry to our members and others timely information on livestock management and feeding and related subjects.

5—Special articles are written for farm, livestock and industry publications, often on request from the publications themselves. Most of these, naturally, deal with livestock management and feeding; but they also include such things as cotton developments, soybean production in cotton states, and other topics of interest.

6—A field staff works with experiment stations, land grant colleges, extension and vocational staffs, livestock organizations, and our own membership and others. These men do not work as salesmen taking orders for cottonseed feed products, but are comparable to an extension service specialist who works to encourage sound farming and livestock practices. In fact, they are all former extension staff members. I have pointed out that these men are not SALESMEN in the sense of taking orders for products, but there is much evidence that the public relations work that they do is a strong factor in creating greater interest in research with, and use of, cottonseed feed products.

7—In many other ways our educational service staff at headquarters and in the field works to aid agricultural progress and the public relations of our industry. Activities include such varied things as helping to plan oil mill exhibits at fairs and livestock shows—supplying information for speeches made by our members at clubs—writing radio scripts—making talks—answering special feeding inquiries—working with feed control authorities—and numerous others.

8—Our educational service also is co-operating with research institutions in investigating possible new oilseed crops which offer promise for farm production and processing in cotton states, to supplement such present commercial oilseeds as cottonseed, soybeans, flaxseed and peanuts. We also actively cooperate with oilseed processing research, and investigations with a view of increasing the quality of our cottonseed feed products.

### Opportunities

I hope that this outline, necessarily incomplete, has given you some idea of our varied activities and has suggested some of the opportunities that all of us have for rendering service to the producers of our raw materials and the users of our products. Your industry, as individuals and as an association, share with us not only many common problems; but also a mutual responsibility of rendering ever increasing service to those who produce

our raw material and those who use our feed products.

As I said in the beginning, we are competitors in one sense; but the real problem that all of us face with reference to feed products is that of helping the livestock producer do a better job. We can do this most effectively by working together on broad, constructive and aggressive programs of service.

There is a real opportunity for our organizations to work together—perhaps you can foresee the value in some future day of all oilseed protein producers working jointly in an educational program which would supply publications, advertisements and other material stressing PROTEIN—

while individual members do their own individual advertising of certain products and brands. I believe that such a development would add much strength and effectiveness to all of our individual efforts.

Whether this comes soon, or in the distant future, I do want to pledge to you all of the cooperation that we can give to your Association—and to urge you to help your Association officials in every way possible in building a strong, constructive program of activities that will help your own business, the user of your products and the nation as a whole.

This is the great challenge. It is up to you to answer what you will do about it.

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# Soybeans and the COUNTRY ELEVATOR

By **LAWRENCE FARLOW**

Secretary, Farmers Grain Dealers Association  
of Illinois, Urbana, Ill.

**I** AM SURE the grain dealers throughout the country appreciate the recognition that has been shown them by setting aside one session of your program for the discussion of the country elevator aspects of this soybean business. I am honored to be invited to open this session with a brief discussion of a subject that I find so intriguing, "Soybeans and the Country Elevator."

I would like to preface my remarks by relating briefly the circumstances under which I was first introduced to a soybean. I was born and raised on a farm in Jefferson County, Ill. Sometimes I feel like I am bragging when I say that that farm consisted of light soil. However, my father managed to raise a family of 10 children on 100 acres. To do this on that type of soil it was necessary to turn to livestock since the grain that could be produced would not have kept the family in shoes, and we did wear shoes in the winter time.

To grow livestock it was necessary to have an abundance of forage crops. Timothy hay was suitable for horses and mules, but cattle required something more potent. Science had not taught us how to grow red clover, sweet clover or alfalfa on land with a tight clay subsoil.

My first recollection is that we grew cow-pea hay for the cattle. Cow-peas on soil that would sprout a pea have a tendency to vine like morning glories, form-

ing a woven mat of foliage. A mowing machine would cut this mat of hay into strips resembling strands of woven wire. The hay rake simply rolled them into solid rolls. It required courage and patience to separate these windrows into morsels that could be lifted into a hay rack. In those days a farm boy of 15 years was expected to make a hand on the farm, and the job I dreaded most was putting up pea hay.

About 1905 my father announced he had ordered a half bushel of a new kind of beans from a seed house. They were called Soja Beans. These seed were of the black hay bean variety. We planted the half bushel of seed on an acre of ground and the results were quite satisfactory. Since there was no suitable machinery for harvesting and threshing, the beans were mowed and we flailed out enough beans on the barn floor to provide our own seed. The soybean proved to be an improvement over the cow peas for hay, and from that time on soybeans were a part of our regular crop rotation. Before I left the farm in 1912 we were raising yellow beans, which I believe were of the Manchu variety. There was still no suitable machinery for harvesting and threshing and no market outlet other than for seed. Therefore, in our rotation we grew soybeans for hay only.

In 1912 I left the farm to take over the management of a country elevator, the Fisher Farmers Grain and Coal Co., in Champaign County. During my 7 years of employment in that capacity I had no experience with soybeans, since up to 1919 they had not become a commercial crop. As I look back over the years it is amazing to note the important changes that have come about in the grain business as a result of the rapid development of the soybean industry.

Agricultural colleges and general farm organizations have encouraged the production of soybeans as a means of providing better utilization of our soil, and another basket in which the farmer could take the products of his farm to market. Many pioneers in the soybean processing industry were farm minded men who became interested in processing to provide a market for beans. These men were able to enlist the cooperation of industrialists who saw an opportunity to develop a new and profitable industry. Barn lot dieticians helped the cause along by discovering that a bushel of corn would produce more pork, beef or poultry when fed with a protein

supplement. This created a market for soybean oil meal, making soybean processing a safe business venture. The manufacturer of farm implements opened the way for large scale production of soybeans by inventing and putting on the market the combine harvester. The country elevator did its part by helping to disseminate valuable information regarding the production and marketing of this new crop.

The pot-bellied stove in the country elevator provided a meeting place for farmers to exchange ideas, which exchange of ideas had an important part in making the soybean a popular crop. The American Soybean Association has done a splendid job of coordinating all these efforts and presenting an organized front to promote the interests of soybean growers in industry, in legislation, and in world trade.

Soybean production presented to the country elevators new opportunities which they are only now beginning to fully realize. These opportunities included better utilization of land to produce more grain for the market; the production of a crop which by its very nature had to move through country elevators to processing plants before it could be utilized as food and feed; the return of the soybean meal for livestock feeding, increasing the opportunity for a feed business, and the profitable utilization of enlarged storage facilities for storing surplus beans until they were needed by the processors.

## Wrong Logic

One of the most important of these opportunities has been the better utilization of farm land in the area served by the elevator. I recall that about 15 years ago a representative of one of the railroads operating in the heavier soybean producing area came to my office with a suggestion that country elevators should be encouraged to enlarge their storage facilities to take care of the larger volume of business that would result from the increase in soybean production. I put up a little argument which I thought was logical at that time. I told him that the farmers in that area had been farming all their land for a number of years; that they had been growing 40 bushels of corn, 30 bushels of oats and 20 bushels of wheat per acre, and that when any of those acres were converted to soybeans having a yield of 17 or 18 bushels per acre it would reduce rather than increase the bushelage of grain handled. Statistical information now available proves the fallacy of that theory. The increase in acreage planted to soybeans has by no means been reflected in a like reduction of acreage planted to other crops.

It appears that the first soybean processing plants in Illinois were put into operation about 1922 to 1924. The first commercial soybeans were handled by country elevators about 1923. The first combine harvesters were introduced about 1925.

The first complete records of acreage and production given in reports of the U. S. Department of Agriculture are for the year 1927. In that year beans harvested in the United States totaled 621,000 acres,

LAWRENCE FARLOW





with a total yield of 7,459,000 bushels. The average yield per acre was 12 bushels. Illinois took the lead in acreage and production that year and has continued to be the leading soybean producing state. In 1927 farmers in Illinois harvested 220,000 acres with a total yield of 2,392,000 bushels.

I have prepared a table showing a comparison of acreage and production of crops handled by country elevators for the years 1927 and 1949. The figures are taken from reports issued by the U. S. Department of Agriculture and Illinois Cooperative Crop Reporting Service. The comparative statistics for both the United States and the State of Illinois are as shown in the table at right:

This table shows that for the United States as a whole there may have been some shifting of acreage from corn to wheat, but because of higher yields per acre the total production of all grain crops has been increased substantially. And in addition to the grain crops the farmer found approximately 10 million acres for the production of 222 million bushels of soybeans.

In Illinois the acreage planted to the various grain crops remained about the same, but because of the development of hybrid corn and better varieties of other grain crops, grain production was increased more than 50 percent. At the same time the farmers found an additional 3 million acres on which they produced 82 million bushels of soybeans. These figures

UNITED STATES				
1927	Acres	Yield per Acre	Total Production	Price
Corn	98,303,000	28 bu.	2,763,000,000 bu.	\$ .72
Oats	41,941,000	28 bu.	1,182,594,000 bu.	.45
Wheat	58,784,000	15 bu.	876,374,000 bu.	1.11
Total	199,028,000		4,822,968,000 bu.	
Soybeans	821,000	12 bu.	7,459,000 bu.	\$1.40 to \$2.65
1949	Acres	Yield per Acre	Total Production	Price
Corn	86,735,000	39 bu.	3,377,790,000 bu.	\$1.19
Oats	40,560,000	32 bu.	1,322,924,000 bu.	.63
Wheat	76,751,000	15 bu.	1,146,463,000 bu.	1.90
Total	204,046,000		5,841,177,000 bu.	
Soybeans	9,912,000	22 bu.	222,305,000 bu.	\$2.10

ILLINOIS				
1927	Acres	Yield per Acre	Total Production	Price
Corn	8,469,000	38 bu.	322,175,000 bu.	\$ .72
Oats	4,309,000	24 bu.	102,204,000 bu.	.45
Wheat	2,509,000	14 bu.	34,844,000 bu.	1.11
Total	15,287,000		459,223,000 bu.	
Soybeans	220,000	13 bu.	2,392,000 bu.	\$1.40
1949	Acres	Yield per Acre	Total Production	Price
Corn	9,280,000	56 bu.	518,112,000 bu.	\$1.15
Oats	3,988,000	43 bu.	168,990,000 bu.	.60
Wheat	2,048,000	24 bu.	49,172,000 bu.	1.80
Total	15,314,000		736,274,000 bu.	
Soybeans	3,177,000	26 bu.	82,602,000 bu.	\$2.10

indicate that the total bushels of soybeans produced can be considered as net gain in volume of business for the country elevators.

One important factor which makes the soybean a desirable crop from the viewpoint of the country elevator is the large percent of the crop that moves by rail

to a milling center for processing. Information released by the Association of American Railroads reveals that in 1949 the Class one railroads originated 701,334 carloads, or 1,244,000 bushels of wheat which was 108.5 percent of the crop raised that year. This is accounted for by the fact that some of the wheat had two rides,



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Any standard or special unit in regular or special steel construction.

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Portable and fixed, with standard screw or special design, in steel and in stainless steel constructions.

## We look for trouble!

Yes, we look for trouble and we welcome the opportunity to tackle anything you might run up against in your soybean extraction operations. We maintain a research and experimental department, and this is where we analyze these "troubles" then recommend to you the most practical and efficient methods of extraction, to fit your particular operation.

Our 72 years experience makes us feel that we are in a position to be a very definite help to you. We offer our services without obligation, of course.

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first to a terminal elevator and then to the seaboard for export or to a mill for milling. Corn shipped in the same year amounted to 378,472 carloads, or 696,885,280 bushels. This was approximately 21 percent of the crop grown that year. Oats shipments amounted to 107,089 carloads, or 269,757,101 bushels. This was approximately 20 percent of the crop. In that same year soybean shipments amounted to 116,566 carloads or 199,444,426 bushels, which was approximately 89 percent of the crop. When 89 percent of a crop goes to market it is a good crop for the country elevator.

### Return on Storage

Another important consideration is the opportunity for storage at the country station, which gives the country elevator some assurance of earning a reasonable return on the investment in storage facilities. In 1927 the average storage capacity of country elevators in Illinois was about 35,000 bushels. At that time there was no incentive for building storage bins. Country elevator operators had learned that first year crop of shelled corn could not be carried in an elevator without the risk of heating and spoilage, and it was considered better practice for the farmer to store his corn, in the ear, on the farm until it was sold for shipment to the terminal market. It is only since the government has been holding corn that has been carried over in the crib one summer that country elevators have been willing to take the risk of storing shelled corn.

Elevator operators had also learned that climatic conditions in Illinois are not suitable for storing wheat. Oats were a storable crop, when threshed from the shock under favorable conditions, and some country elevators did earn a carrying charge by holding oats in storage in years when the distant futures were higher than the cash market. However, the assurance of profitable storage was not sufficient to jus-

tify building anything more than a merchandising house.

The soybean when properly harvested can be safely stored from one harvest till the next. Milling in transit tariffs which permit the processors to receive soybeans by rail shipment from country elevators and forward the meal to most any destination at the through rate from point of origin of the beans to final destination of the by-product, establishes a sound financial basis for country elevator storage. Processors have been willing to enter into contracts with country elevators for the storage of soybeans, with a guaranteed minimum storage allowance, in order that they might have a supply of beans to draw on any time they were needed for processing.

Principally as a result of the opportunity for storing soybeans, the average storage capacity of country elevator storage in the heavy soybean producing counties has been more than doubled in the last 10 years.

Not all country elevators handle feed, but the increasing use of soybean meal as a protein supplement for livestock feeding has presented an opportunity for a country elevator to carry on a profitable sideline business in feed. I happen to have a report from one country elevator that handled its first carload of soybeans in 1923. Feed sales by that company in 1922 were a little under \$10,000. Last year the same company handled nearly 200,000 bushels of soybeans and feed sales amounted to more than \$50,000.

Another important consideration is the extension of the country grain business into areas where grain production was not sufficient to justify the operation of a grain elevator. This applies especially to a large area in southern Illinois. It has been found that soybeans can be grown successfully on soil that is too thin for profitable grain farming. A considerable number of new elevators have been built in that area during the last 5 years and

small elevators have been enlarged to accommodate the increasing volume of business. The first grain elevator in Jefferson County, my native county, was completed at Mt. Vernon a little more than a year ago. I have a report from a farmers elevator company in Marion County which reveals a miraculous expansion in volume of business since the first car of soybeans was handled in 1935. At that time the company had a 10,000-bushel elevator and was handling a little over 100,000 bushels of grain a year. The capacity of the elevator has been increased to 60,000 bushels and last year the company handled 363,000 bushels of soybeans, and more than 500,000 bushels of grain.

As more harvesting machinery becomes accessible, and more elevators are built to provide a convenient market place, I expect to see a further expansion of soybean production in southern Illinois.

There have been four major developments in the last 25 years which have contributed to the larger volume of business handled by country elevators, and the necessity for enlarging and improving country elevator handling and storage facilities.

First, the complete change over from horse-drawn implements to mechanized farming has enabled farmers to plant their crops in season thereby insuring more uniform production, and at the same time replaced feed for horses with motor fuel, releasing more grain for market.

Second, the combine harvester has greatly accelerated the harvesting of crops causing heavier deliveries of grain during a shorter harvest season.

Third, the development of hybrid corn has increased the yield per acre by more than thirty percent.

And last, but not least, the development of the soybean as a major crop has provided a new commodity in large volume without replacing any other crop.

## WHAT SURPLUS?

### *The feed industry will use all your soybeans*

With formula feed operations constantly expanding, the feed industry, of which Pillsbury is an important part, provides a big and important market for soybeans — and can be expected to become an even larger buyer in the future.

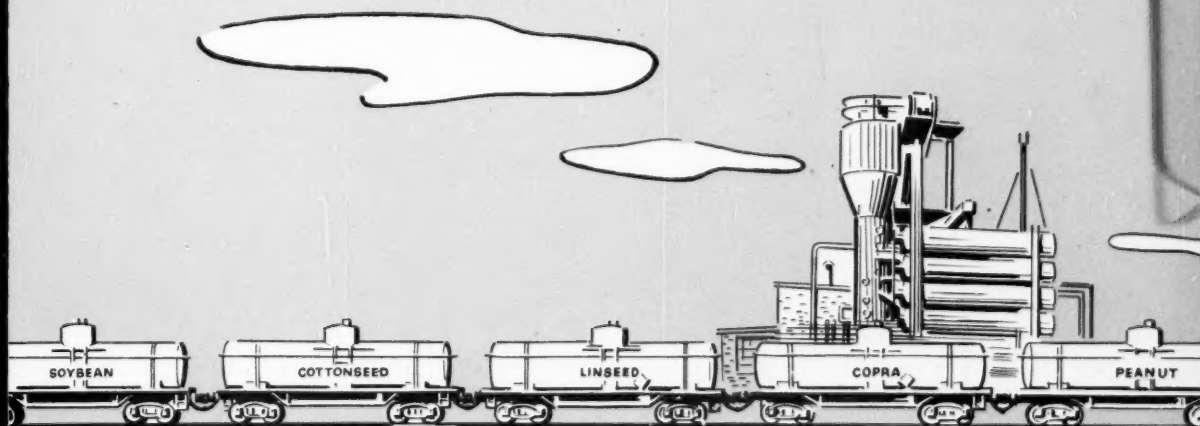
The big crop in prospect for 1950 does not spell "surplus." Rest assured that it may be an ample, but not excessive, supply of the very best vegetable protein.

Telephone Clinton 1080, or Centerville 147, for quotations.

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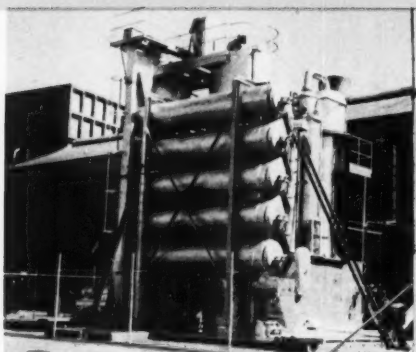
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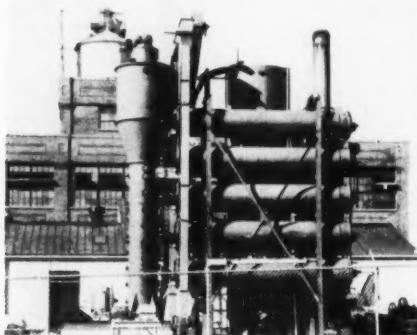
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# ANDERSON EXSOLEX PROCESS

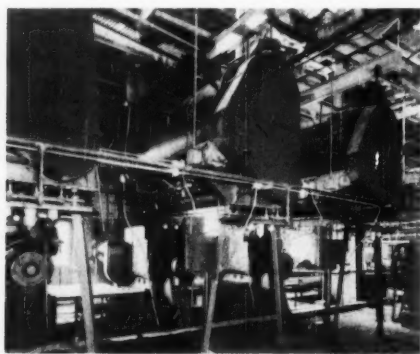
*offers multiple-extraction to the soybean oil miller*



**SOUTH AFRICA**—Cottonseed, peanuts and sunflower seeds are all three processed in a South African plant having an Exsolex installation.



**RED WING**—The Pittsburgh Plate Glass Company processes flaxseed in their Exsolex installation in Red Wing, Minnesota.



**WILSON**—The Delta Products Company is achieving amazing results with cottonseed at their Wilson, Arkansas, Exsolex plant.

## Multiple-Extraction Advantages

Like a one-man band, the Anderson Exsolex Process is versatile. The Exsolex system can be readily changed over from one material to another, thereby offering the soybean oil miller unusual processing opportunities that he cannot gain from a single-purpose processing plant. The oil miller can change to alternate materials when market conditions become untenable on one material. Exsolex also permits the miller with a limited supply of one material to increase tonnage by handling two or more oleaginous seeds or nuts. Only Exsolex offers these advantages.

Basically the Exsolex Process consists of Pre-Expellers, an Anderson Solvent Extraction Unit and certain supplementary equipment necessary for the proper preparation of materials before entering the solvent extraction process. The Exsolex process has revolutionized oil milling, producing oil and meal of exceptionally high quality with a remarkable low residual oil meal content. The processor primarily interested in soybeans can use Exsolex profitably in a number of ways. He can run the Exsolex process on many oleaginous materials . . . cottonseed, flaxseed, peanuts, soybeans, etc.

## If You Own A Solvent Plant

Perhaps you own a solvent extraction plant now. If so, there is a possibility Anderson can readily convert your milling process over to the Exsolex process by the addition of PreExpellers and certain auxiliary equipment. The resultant savings will amortize the cost within a short time.

## If You Own An Expeller Plant

Likewise, if you own an Expeller plant, the Expellers can be converted into PreExpellers and with the addition of an Anderson Solvent Extraction Unit and supplementary equipment, you can have an Exsolex process operation. Investigate these possibilities today. An Anderson engineer will be glad to survey your equipment and make recommendations.



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# ANDERSON SOLVENT EXTRACTION UNITS

*cut operating costs . . . construction costs*

## Outdoor Construction

When Anderson engineers developed the outdoor solvent extraction plant, they reduced the cost of solvent extraction for the soybean oil miller. This outdoor plant comes to your location prefabricated and is readily erected on a nearby plot of ground, in most cases without adding to your building facilities. Likewise, Anderson Solvent Extraction Units can be moved, if desired, to another location at a later date.

## No Costly Building

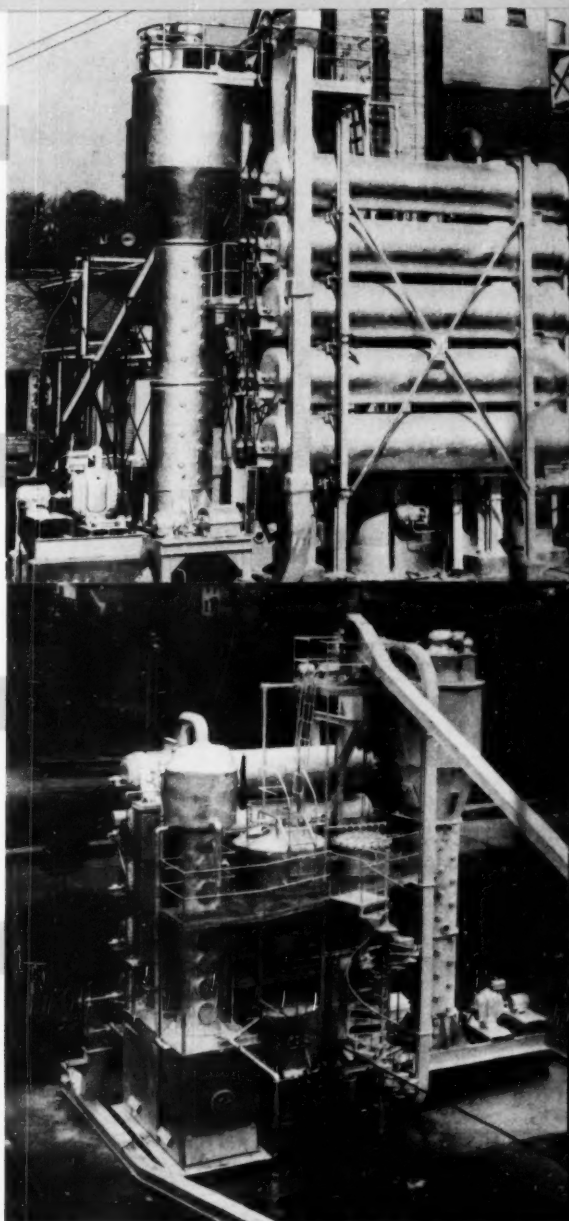
The outdoor feature of the Anderson Solvent Extraction Plant avoids the needless expense of a costly building. This feature, in most instances, substantially lowers your investment. With a reduction of investment you achieve lower processing costs.

## Simplified Wage Structure

The Anderson Solvent Extraction Unit is operated from a safely-removed remote control panel. The centralization of controls greatly eases the problem of operation . . . enables the oil miller to get maximum tonnage with minimum labor.

## Versatile, Efficient Extraction


The Anderson Extraction Column is designed with many adjustable features to handle different oleaginous materials. The Settling Chamber for fines control is a patented, exclusive feature, and the Expeller-like Column Discharge Device removes up to one-half of the solvent customarily found in conventional systems. This reduces steam and cooling water requirements. If you need a solvent extraction plant, be sure to investigate the economical savings of the Anderson outdoor unit.




Two of the Anderson Solvent Extraction Units that are processing soybeans successfully.

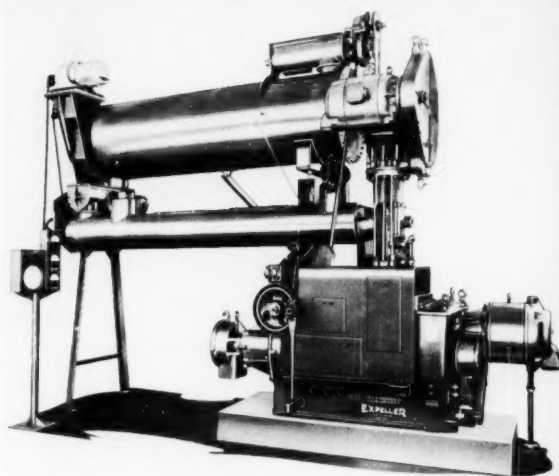
## leader in Oil Milling Extraction Equipment

# Anderson Expellers are popular with plants making their own feeds

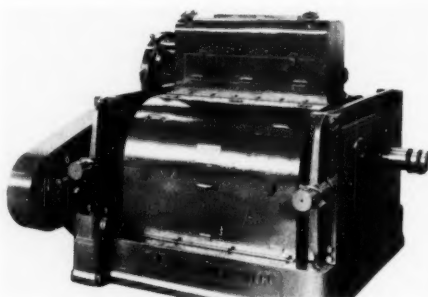
 For a half century America's finest soybean oil meal has been Expeller meal. Feed mixers know that Expeller soybean oil meal with its famous nut-like flavor brings premium prices. Experiment stations have proven that animals do better on feeds containing Expeller oil meal. There is only one way to produce this preferred oil meal . . . with Anderson Expellers! *This nut-like flavor is the result of 50 years close cooperation between Anderson engineers, millers and feeders.* In addition, the oil produced by Expellers is of the very highest quality, ideal for all edible uses. Investigate Expellers. Find out the profit possibilities under today's market conditions.

## ANDERSON COMPLETELY EQUIPS OIL MILLS

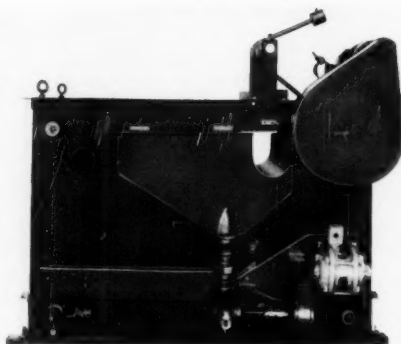
 Just one telephone call will place you in touch with a company competently qualified to completely equip your oil mill. The V. D. Anderson Company can furnish turnkey installations, if you desire, furnishing complete equipment for an oil mill, erecting it and turning the plant over to you ready for operation. Anderson auxiliary equipment includes dryers, flakers, screening tanks and other types of equipment. Whether you need a slight addition to your present mill or a complete new mill, consult Anderson. We welcome your inquiry.



Anderson Twin Motor Super Duo Expeller



Anderson Screening Tank



Anderson Flaker



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# WHAT WILL WE DO with the 1950 CROP?

By FRED MAYWALD

Manager grain department, Farmers Grain Dealers Association of Iowa, Des Moines, Iowa

**T**HE ASSIGNED subject "What will we do with the 1950 crop?" has, for the past several weeks, haunted my waking hours and played a stellar roll in my nightmares.

A flippant answer to the question "What will we do with the 1950 crop?" is easy. Except for a small percentage of the 1950 crop, which we may export, we will process this year's production and consume the oil and the meal. The real question is "Who will get hurt? How much? When? Why? And is it necessary that anyone get hurt?"

I manage the grain department of a regional cooperative—the Farmers Grain Dealers Association of Iowa—and when I think of what we are going to do with the 1950 crop I instinctively think of my own situation and shudder.

When this crop begins to move we will be doing business with about 200 country elevators. I haven't the least doubt that if weather is favorable that within 3 weeks after the combines get into the fields that at least one-half of the 200 elevators with whom we do our business will be completely blocked—that farmers will be unable to unload beans in their own communities and will be frantically searching for storage wherever they hope it can be found—and many producers will no doubt sacrifice their beans at prices far less than the market will justify. There will be a great deal of bitterness and many misunderstandings between the handlers of soybeans and the producers of soybeans, and between ourselves and our customers, and between handlers and processors.

We as bean handlers aren't likely to get hurt in any way that will be reflected in our profit and loss statement. Our gross margins will work out about the same whether beans net the producer \$1.50 a bushel or \$3.50. But the more I contemplate the problem the more I am convinced that Hadacol should prepare to satisfy a terrific increase in the demand for their product come October and the bean harvest.

## Boxcar Shortage

I don't believe though that I need waste your time stating the problem or in reviewing in detail the inadequacies of the storage available, the perennial boxcar shortage, the increased acreage, the favorable crop prospect.

I could deal at length with the problem but I want first to state my conclusion as to the only conceivable answer.

You may have heard of the National Federation of Grain Cooperatives. It is a Federation of the several regional grain marketing cooperatives such as Illinois Grain, Indiana Grain, and our own Association. This Federation interests itself in commodity marketing problems and it so happens that I am chairman of one of its commodity committees, the soybean committee.

The soybean committee of the National Federation of Grain Cooperatives is taking this opportunity to publicly state from this excellent forum its position as to what we must do to avoid chaos in marketing the 1950 crop.

## Letter to Brannan

This is the Federation's considered position, carefully stated, as it has been presented in an open letter to the Secretary of Agriculture. The letter follows:

Honorable Charles F. Brannan,  
Secretary of Agriculture,  
Washington, D. C.

My Dear Mr. Secretary:

Utter chaos in soybean marketing is just around the corner—less than 60 days down the street.

Except for the storage owned and operated by the soybean processors there is practically no commercial storage available or likely to be available in country elevators, sub-terminals or terminals.

Perhaps some relief could be had if Commodity Credit Corp. would guarantee to lease a specific amount of steel bin capacity to producers, associations of producers or commercial warehousemen. This, however, would seem a forlorn hope. Commodity Credit Corp. will no doubt experience considerable difficulty in getting enough steel bins fabricated and erected to store the unknown quantity of corn it is now in the process of taking over.

Actually, only adequate farm storage can prevent the development of a marketing situation that will put the producers of soybeans at the mercy of the processors who will be helpless, or at the mercy of the speculators who will be ruthless.

At this late hour, and under present and probable circumstances, perhaps the only hope of improvising enough farm storage to circumvent this predictable utter chaos is to immediately announce a soybean loan based on 90 percent of parity.

If PMA has no confidence that 1950 bean prices will average 90 percent of parity surely the producer can't be expected to have such confidence.

Improvising farm storage will be expensive.

Under the threat of these seemingly inevitable circumstances the producer is entitled to a loan level that will justify an all out effort to provide the farm storage needed to avert a marketing fiasco.

Actually, the combined production of soybeans and cottonseed would seem to justify soybean prices that would average at least as high as those that prevailed during the last marketing year.

The price patterns of recent marketing years would also indicate the strong probability that prices paid bean producers will be substantially higher sometime during the months subsequent to the bean harvest.

A high support price on beans isn't likely to result in a burdensome take-over.

The processed products of soybeans are of such primary importance in a war economy or a rearmament economy that there is every reason to believe that with a 90 percent support price established, the demand inherent in the developing economic climate will move the 1950 bean crop into consumption at stable prices whereas a low support price might lead to a situation that would so disgust the soybean producer that it might be difficult to maintain the production we may desperately need.

In any case any conceivable take-over of beans could never amount to but a very small fraction of the volume of the wheat and corn take-over.

Lack of transportation is another factor over which the producer has no control that will almost certainly result in beans backing up into farm storage.

It would seem imperative, as imperative as it is obvious, that a support price based on 90 percent of parity should be announced immediately and that concurrently a concerted campaign to encourage farm storage should be undertaken by PMA, the Soybean Association, the processing industry, warehousemen, farm organizations and the grain trade.

Perhaps the press release announcing a 90 percent loan rate should carry the statement that the higher loan rate was agreed upon only because the Department was aware that additional farm storage was a necessity, and because the Department was confident bean producers would respond to the higher loan rate by improvising the necessary storage—in fact it was felt that in return for the 90 percent of parity support price producers would be under obligation to farm store enough beans to insure orderly marketing.

Our position, as we have stated it above, has been submitted to several interested groups and their support has been solicited. We think you will find our position widely and enthusiastically supported by farm people at the grass roots and on up through their organizations.

You can rest assured that the National Federation of Grain Cooperatives stands ready to offer you any assistance or counsel that you may request.

We urge the immediate consideration of this pressing problem.

Very truly yours

FRED MAYWALD,  
Chairman—Soybean Committee—  
National Federation of  
Grain Cooperatives.

We in Iowa have announced that our Association will sponsor six meetings to be held over our own state to which we will invite the managers and directors from the country elevators with whom we are associated, the county PMA committeemen, the PMA field men, state PMA committeemen and staff people, county agents, representatives from the extension service of Iowa State College, and the division officials of the railroads serving our state.

We will try at these meetings to agree on how each and all of us can best use every available instrument of publicity to get the producer told that he must prepare farm storage for his beans. We expect to recommend the use of advertising in the local and county press, spot radio statements, letters, cards, placards, posters, phone calls, party line and personal, smoke signals and carrier pigeons.

Because I think some of the difficulties that we will soon be facing can be traced to the fact that the soybean industry is little more than a lusty infant, I am going to ask that you bear with me for a few more minutes while I say something about some aspects of soybean marketing as I have observed and experienced them.

The marks of immaturity are easily recognized.

We must remember that much of the soybean crushing capacity blossomed in a hot-house when the conversion margin was set by contract and the price of beans was fixed by law and regulation. The only problem the processor faced in those days was how to get his year's requirements contracted at the earliest possible moment with the least amount of skulduggery. I sometimes wonder if processors aren't still too much under the influence of a hang over from that lush era.

The producer, too, in those palmy days had only one problem, whether to deliver his beans to the elevator directly from the combine or to farm store them and earn 7 cents storage. It was in those years that farmers acquired the habit of delivering about 75 to 90 percent of the crop from the field, a habit that too few of them have as yet broken.

When price controls were lifted this peculiar and artificial bean marketing system was slowly integrated into the free marketing system that has grown up during the last 100 years. That free marketing system, however, was at that time crippled and limping from its encounter with price controls and it didn't and does not yet offer the stability essential to good marketing.

The futures market was established. Now, I am on record as a firm believer in the utility of free futures markets. In my view they are a necessity, at least until a demonstrably superior substitute can prove itself workable.

### Help or Hindrance?

But I will confess to some misgivings as to whether the soybean futures market has been a help or a hindrance to the producer, the handler, the processor or the consumer. It is obviously immature, scarcely out of the kindergarten. It is jittery. It goes to the wildest extremes—and I don't know whether it exaggerates or levels out price movements.

The processors I have talked to about the futures market seem to think it has been helpful and they are unanimous in wanting it to continue in operation. I don't think they use it, at least not extensively. The processor unconsciously says to himself "there is the futures market where I can hedge". And after a 50-cent break in prices it is no doubt comforting to him to recall that he could have hedged.

I find it interesting to compare the corn and soybean processors' marketing habits. We do a considerable volume of business with corn processors and it is my observation that many of them rely on buying each day's processing requirements on that day's market. Obviously at the end of a year they have automatically bought their requirements at the average price for the year, so if their sales department over the same year sells their product at the day-to-day market, then the corn processor has, without carrying burdensome stocks, earned an average profit and minimized his speculative risks.

It would seem to me that soybean processors might look with some envy on that system. This might be the year when processors could feel assured there will be am-

ple supplies in the market every day—supplies that can be had at any time they are willing to pay the market, or a little over the market, in order to cover their day-to-day requirements.

### Tendency to Hold

I have for some time been aware of a tendency to spread the marketing of soybeans over the marketing year rather than dump them all in October. We buy and sell beans almost every day and our average daily volume has been slowly but noticeably increasing.

I have had some figures worked up reflecting our own operations.

We are not big handlers of beans. During the marketing year 1947-48 we bought 3 million bushels of beans. We bought just over half of that 3 million in 1 month, October. During the next marketing year 1948-49 we again handled almost 3 million bushels and again we booked almost 50 percent of our total during October. Last year 1949-50 however, we handled almost 4 million bushels of beans but purchased less than 25 percent of them during October.

Every speaker is under compulsion to say a word in passing, so in passing I would like to say a word about the boxcar shortage and rail transportation in general. Unfortunately, though, the word I want to say is unprintable. I must admit that insofar as the carriers are concerned I am completely defeatist. I don't expect them to do anything and they never disappoint me. And now that the government has taken over the railroads and they have merged the top brass of the railroads with the top brass of the army I suspect we are going to have to coin a new word that will make snafu synonymous with orderly.

Even though I haven't the slightest hope that it will do one bit of good I suppose on the theory that the squeaking wheel gets the grease everyone interested in what we will do with the 1950 crop should be hammering at the railroads to make preparation to do their duty at the customary tariff plus the usual emergency increases.

Now the people who buy the beans we sell have sold us on the idea that they are wonderful people. They are, but I am just a little apprehensive though about their good intentions toward this crop. The wary buyers I talk to give me the impression that they don't expect to buy this bean crop. They intend to ambush it. And accompanying those nightmares I mentioned, I sometimes think I hear noises that sound strangely like some unrecognizable, though vaguely familiar processor practicing up licking his chops.

Seriously, though, it would be asking too much of human nature to expect that buyers would fail to take full advantage of a chaotic bean market. But a situation could develop where the least ethical of the bean buyers might set the standard for the entire industry to the everlasting disgrace of the industry.

If there are some statesmen in the bean processing industry they might consider whether they might push vigorously for a 90 percent of parity support price. The producer would appreciate it and so would those of us who deal with the producer.

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# FORWARD TO HALF-A-BILLION!

By **CLYDE H. HENDRIX**

Vice President, Pillsbury Mills, Inc.,  
Clinton, Iowa

**I**T IS MY considered observation that the soybean industry, growers, handlers, and most especially processors, have become a little confused and have lost some confidence in the direction in which they are traveling in this great industry.

It has been a hazardous year for the processors of the soybean crop. For reasons which we will not discuss, the relationship of oil and soybean meal and the cost of soybeans has been such that a non-speculative profit in the processing of the 1949 soybean crop has been most discouraging.

A great many growers to whom I have talked are filled with trepidation at this time because our oncoming crop of soybeans appears to be some 60 or 70 million bushels larger than it has ever been before. I find a great many people in the industry, particularly the intermediate handlers of beans, who are concerned that there may be a little carryover of old crop beans into new crop this coming year. They feel that such a thing may surely happen in greater quantity during the years ahead.

All these fears are pure poppycock—fiddle faddle and frim frams if you please—and I shall not only attempt to, but I will, prove to you that they are.

Everyone connected with the soybean industry, from the raising of beans through the handling and processing, and on to their final return to consumption . . . animal, human, technological, or whatever it may be—all of us need to have more courage and more confidence in the miracle crop of agriculture—the soybean.

There has never been any industry which grew rapidly, and in this connection the soybean industry has a most enviable record, but that it came upon foul days, and its progress was beset by problems and resistances that discouraged weak people even though the trend itself was ever upward. The record chart of the soybean in America has been constantly upward. Its future will follow the same direction, and the most foolish thing of all would be for us to become discouraged and lose our vision, merely because we have temporary dips in this ever-upward chart.

In the beginning, the very varieties of soybeans that were introduced in America were nothing like those of today. The selection and breeding of the seed has been hardly short of a miracle. We now grow more beans, and better beans, with a higher oil content, with more resistance to disease and the elements, and better adaptation to

the soils throughout the different parts of our country, than we did a few years ago. The future development of the strains . . . hybrid or come what may . . . will be progressive.

Two decades ago, the processing capacity that we had was meager, and in the light of present day processing, it was pitifully inadequate and inefficient. The resulting products from the processing of soybeans in these two short decades have increased in quality and in variety of uses many fold. From what was once a tiny crop, we have watched it pass 100 million, 200 million, and this year close to 300 million bushels. And to you who have fears that this figure represents an approach to over-production, I wish to give the challenge, "Forward to Half-a-Billion", which means half a billion bushels of soybeans yearly—and in the nearby, foreseeable future!

## Carryover Good

To those of you who fear a carryover of old crop into the new, I maintain that that condition would be a good thing. It is a pitiful situation when with the approach of each September, feeders who depend on soybean meal as the major source of protein for the feeding rations of livestock, poultry, and turkeys, watch the price of soybean meal skyrocket and those who must carry inventories face a resulting loss when a new crop finally appears.

What is needed is a stabilizing influence between old and new crop soybeans, and this can only be accomplished by MORE beans, the same as it is with wheat and corn and oats and barley, and the other major crops which are a part of our agricultural production. I welcome the day when the crop carryover of soybeans is sufficient to cushion the transition from old to new so that the squeeze is practically non-existent.

Great things are going on all over the world. Transportation and communication progress since the days of the wagon train has shrunk the comparative size of the world from a giant ball to a tiny kernel. Transportation and communication advancements and two world-wide wars and their aftermath, have brought about the intermingling of peoples unsurpassed since the history of mankind was recorded. Parallelizing this movement and our mechanical age is a change in the living habits of the people, not only in America but in varying degrees all over the world.

We are in the midst of what we feed men like to call a "protein cycle." The standard of living, world-wide, is changing from a low-protein cereal diet to a higher-protein diet derived not only from vegetable sources but from those vital foods . . . meat, milk, eggs, butter, cheese, etc. These high protein foods are more in demand in our Land of Plenty because the people generally are engaged in less physical activity and accordingly require fewer starches and carbohydrates. The same is becoming true in less privileged countries where whole races are inches shorter and inches smaller around the waist because of the malnutrition of a protein-deficient cereal diet.

The most ideal universal source of protein today for use in connection with grains, carbohydrates, vitamins, and minerals, to make this conversion of cereal products into protein products, is **SOYBEAN MEAL**. It is the most adaptable protein in America at the present time—the only one which can be used universally in the feeding of cattle, hogs, sheep, and poultry with profitable, beneficial effects to all.

To those of you who are faltering, whose vision of this great industry has dimmed a little—perhaps because its rapid movement and growth has smoke-filled your eyes, I **SPEAK TO YOU**.

Last night nearly one-half the world's people went to sleep hungry. This morning, and every morning, there are 50,000 more people for breakfast than there were the night before. In America each year we have 1 million more mouths to feed, and they are demanding—not only this million but the other people in this awakening world—a diet that is ever richer in health building and palate satisfying protein foods.

I am a feed man as well as a soybean processor, and one who has grown up with both industries. In 1938—only 12 years ago—the production of soybean meal was slightly in excess of 1 million tons. The 1949-50 estimate is 4,500,000 tons. This great growth has come about in a single decade.

CLYDE H. HENDRIX



In 1938 the feed industry produced 12 million tons of balanced rations. This year we estimate that it will be 27,750,000. This is the record—the paralleling records—of two industries which are closely tied together. Those of us in the formula feed business have every confidence and every right to believe that the mixed feed volume in the foreseeable future will go to 50 million tons per year. And you have every right to expect that if it does (and it will) that the production of soybean meal will reach approximately 8,500,000 tons in order to keep pace with the demand of increased feeding of balanced rations to livestock and poultry.

### Meal Saga

The saga of the use of soybean meal for livestock feeding is a romance all its own. Fifteen years ago, I and probably you, saw slabs of pork finished on soybeans and grain that was so limp that it would fall on both sides of your arm, and if the temperature was warm, the oil would drip from the meat. I can remember when the advice for the feeding of straight soybeans was almost universally that of feeding them as grown, before we learned that the extraction of the oil was more profitable to the grower and that a higher quality meat product could be produced. You will recall when disparaging competitive stories were rampant that soybean meal was void of proper mineralization . . . and how easily the deficiency in minerals was corrected at a pound-for-pound cost less than the meal itself.

Then we went through the era of soybean meal being deficient in vitamins. But college and experimental stations, research and nutrition experts, taught us how to add these vitamins that we needed. Then there was the great to-do that a vegetable protein could not do a good job unless it was supplemented generously with animal protein, and then came the animal protein factor B-12 and its ramifications.

Now we are to the point where the use of antibiotics in connection with balanced ration feeding makes soybean meal a still more perfect source of protein. And, though we know them not, we can be sure that even now nutritional developments are in progress that will make this great soybean product even more invaluable in the feeding of livestock and poultry.

If time would permit, we could trace the history of soybean oil and find a like record of improvements with just as much reason to hope that in the future they will continue.

So you are wondering what to do about the estimated 270 million plus bushels of soybeans that are facing our combines. Let me give you one simple way that more meal can be used. Formula feed manufacturers are producing 27,750,000 tons of commercial feeds, and if their usage of soybean meal was increased just 5 percent, it would mean an additional immediate market for 196,000 tons of soybean meal. If the usage of soybean meal, by the self same formula feed manufacturers could be increased 10 percent, it would result in almost 400,000 tons of additional soybean meal.

You can believe me when I say to you that a part of the formula feed industry today does not realize how much soybean meal it can properly use by incorporating the advanced knowledge of vitamins, minerals, animal protein factors, antibiotics, etc. The opportunity to have a greater part of this business which already exists is at your very finger tips. You can have a greater share in the growth of this tonnage, which I predict will surely go to 50 million tons yearly because the improved living standards and population increases in America and in the world will demand it in the forms of higher protein foods.

Let us summarize briefly what we have talked about and then state our objectives for the future. We have seen the production of soybean meal grow from 7,600 tons in 1924 to an estimated 4,500,000 tons in 1949. We have seen the formula feed industry grow from a tiny figure at this same date to nearly 28 million tons. We have witnessed the efforts of growers, coupled with the invaluable work of colleges and universities, as well as progressive seed producers, result in changing inferior low-oil producing varieties to hardy, productive seed stock. We have watched the feeding of straight soybeans produce inferior food products, and traced the cycle of nutritional improvements where today, supplemented with vitamins, minerals, APF, antibiotics and the other contributions of research and college men, soybean meal when used with grains and roughages is the ideal protein. As we summarize this progress and recognize the present state of the

protein cycle of human nutrition, coupled with increased population and rising standards of living in the world, we can have no fear of future demand.

It is estimated that we are producing approximately 10 million tons of protein concentrates in the United States. It can easily be said that this production would need to be doubled to properly balance the feeding of our present livestock population. From a study of recent production trends, this protein deficit will very likely be largely filled by soybean meal, and this could call for anywhere from 5 million to 7 million additional tons of soybean meal. Of the present 10 million tons of protein concentrate being produced in the United States, approximately 43 percent is soybean meal, which is equivalent to 172 million bushels of soybeans.

Taking a look at the future and our projected 20 million tons, if soybean meal would increase its proportionate share of the protein field as it has in the past, it could enjoy 70 percent of the protein concentrate market, which would mean 280 million additional bushels of soybeans. Looking at it the worst way, which would be 43 percent—the present ratio—it would call for an additional 172 million bushels of beans to be processed for livestock and poultry feeding. And some of us fear a crop of 270 million bushels!

I challenge any man with courage and vision to doubt that these factors which are on the move, coupled with the combined efforts of growers, handlers, processors, distributors, and users of soybean products, aided and abetted by education and research, will result in a half-billion bushels of soybeans per year, and that figure is nearer than you think.

Forward to half-a-billion!

— s b d —

### OIL CHEMISTS MEET

One of the finest technical programs ever arranged by the American Oil Chemists' Society for a semi-annual convention is announced for the fall meeting in San Francisco, September 26-28, at the Sir Francis Drake hotel, with E. B. Kester as general chairman and H. S. Olcott as program chairman. Both are with the Western Regional Research Laboratory, Albany, Calif.

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# PROMOTING YOUR PRODUCT

By **H. HOWARD BIGGAR**

Associate Director Department of Information,  
National Live Stock and Meat Board

I AM ASKED to give you the story of the origin, functions, source of income and major activities of our organization—the National Live Stock and Meat Board.

First, may I say that, as you know, meat is the product of one of our major industries—the livestock and meat industry. The meat assembly line has its beginning on some 5½ million farms and ranches where meat animals are produced, extends through thousands of livestock marketing agencies which convert the flow of livestock into cash, includes 4,000 major and many other meat packing plants and ends at 250,000 retail meat markets which serve the nation's 150 million consumers. This year we will have a meat output of 22 billion, 200 million pounds.

Meat has been produced in this country ever since the colonists established farms and homes along the Atlantic seaboard. For many years, this livestock and meat industry went complacently about its job. It produced meat animals and these animals were processed to fill the public need for meat. The industry, however, limited its responsibility to the mechanics of production, processing and retailing of meat. Through the years it gave no consideration to the promotion of its product.

No steps were being taken to analyze meat and determine its major selling points. The industry knew that people had a natural liking for meat, and that this food possessed flavor and satiety value which made it popular in the daily diet. That, however, was not enough as events proved.

## Faced Attacks

Not long after the close of World War I, the industry was brought face to face with a rising tide of insidious attacks on its product—attacks which were fostered and perpetuated by unscrupulous interests and influential food faddists.

The health value of meat was being questioned. It was being assailed as the cause of various human ailments. Unfair comparisons were being made of meat with other foods. Statements without any foundation of fact were being given nation-wide circulation.

The industry realized that this condition was of concern to everyone in this business of making the nation's meat supply available. To make matters worse the false claims made concerning meat had to go unchallenged. The industry could not fight back. It was generally conceded that the charges were without basis of fact, but no one could say with any finality that meat was not the cause of various human ailments.

No research had been conducted which would provide facts with which to refute the accusations against meat. It was recognized that this food had been taken too

much for granted. There was every evidence that meat was losing out in the competition among foods and that the stability of the entire industry was threatened.

Taking stock, leaders of the industry became aware that no organized effort was being made to find out the truth about the nutritive value of meat. No steps had been taken to investigate the proper cookery methods for this food. No help was being given to homemakers or public eating establishments in buying meat, nor was any assistance being given to retailers in helping them sell meat. Little or no attention was being given to teaching meat lessons in our educational institutions, or to bringing the story of meat to the medical, dental and dietetic professions.

## Industry Rallied

This was more than 27 years ago, and though the situation was serious, it served at least one useful purpose. It rallied all segments of the livestock and meat industry to a mutual recognition of the need for united action in behalf of their common product.

Meetings were held at strategic points where all branches of the industry could have an opportunity to offer suggestions. In cities of Kansas, Nebraska, Missouri and other states, these meetings served to crystallize industry sentiment in favor of a union of effort in behalf of meat. To make a long story short, an all-industry organization was launched—the National Live Stock and Meat Board, and it began its work in Feb. 1923.

The question as to how this new organization should be directed was discussed in the early planning stages. One of the ideas was that an executive committee should be set up with full power to plan and carry out a program. This idea was shelved in favor of a plan to have representatives of the four industry branches serve as a board of directors. The first board consisted of 17 men. Eleven represented those who produced the meat—two represented livestock marketing interests—two were meat packers and two were from the ranks of the retailers.

The question of financing the organization was discussed and a decision made to have voluntary contributions of 5 cents per car on livestock marketed—this amount to be matched by the packers and order buyers who purchased the livestock.

Soon after the Board was organized a search was made for a man to head the board as general manager. The man selected was R. C. Pollock. He still serves in that capacity and also as director of research. Pollock was asked to assume the task of setting up a tentative program of

work for the Board. This task was not an easy one since he had no precedent to serve as a guide. However, the program he set up was unanimously adopted and although this was 27 years ago, all lines of activity included in that original program have been carried out in detail. Other activities have been added to meet situations as they arise from time to time.

Since the launching of the Board the number of men on the directorate has been increased to 22. Twelve of these are from the ranks of the livestock producers—four represent livestock marketing agencies—three represent the meat packers and three the retail meat dealers and grocery.

As time went on the assessment per car of livestock was raised from 5 cents to 25 cents at the request of livestock interests. Since so many meat animals are marketed by truck the assessments are now fixed at 1 cent per head on cattle, one-third of a cent per head on hogs and calves and one-fifth of a cent per head on sheep. Reductions from the sales are made with the approval of the Packer and Stockyards Act of the U. S. Department of Agriculture. A stamp made on the sales slip explains the purpose of the deductions. I have said that the deductions made for the Board's program on livestock sold, the amounts of which are matched by the packer buyers, are voluntary. Any one who does not wish to be included in this support can have his money refunded. Yet the refusals are very rare. The various livestock marketing organizations act as collecting agencies and remit all collections to the Board.

H. HOWARD BIGGAR



The 22 directors of the Board who direct its policies and approve the various phases of the program are appointed by the various associations which they represent and they serve without remuneration. Two meetings of the directors are held each year.

Invitations are extended to men of all branches of the industry to attend the annual meetings. At our last meeting June 15 and 16, more than 300 men of the industry were in attendance from 34 different states.

At the annual meeting a budget for the next year's program is set up. In the early history of the organization the amount available for Board activities was around \$15,000. At the present time it exceeds \$400,000, and with it we conduct a program which reaches into every state.

You may be interested in knowing that although the members of the board of directors may have different political opinions and probably different ideas on national affairs, no politics are ever discussed in the meetings. Never in the Board's history have resolutions been passed on freight rates, governmental affairs or anything else nor is anything ever discussed which is of a controversial nature. The directors center their attention on plans which are concerned with finding a better market for the industry's product—meat. This is first and foremost in mind as they carry on.

In setting up a program and putting it into action, the directors of the Board began the setting up of departments. The first one to be established was the department of information, whose duties are concerned with taking the story of meat as well as of the Board's activities to the nation through the nation's press, radio and other media.

The next department set up was the department of home economics. The work of this department involves a program on the selection, preparation and proper use of meat, which is directed to the American home, the school and the public eating place.

A third is the department of meat merchandising. The main duties of this department are directed largely to the nation's retail meat dealers and hotel and restaurant personnel. They are given every possible assistance along selling lines, since good merchandising helps to create a greater demand and a better market for meat.

The department of public relations was established to maintain close contact with all branches of the industry. It is recognized in this connection that everyone associated with the industry must be kept informed about the program for meat—the activities under way and the success achieved.

The homemakers service department's program is one of personal contact with educators and homemakers. Its work is conducted largely in the field through the medium of lecture-demonstrations.

The duties of the department of nutrition are, in the main, designed to emphasize to physicians, dietitians, nutritionists and others in the professional field, the contribution of meat to good nutrition.

The department of visual education carries on its work largely through the use of motion pictures and filmstrips. It is recognized that these media offer excellent opportunities to teach the story of meat economically, quickly and effectively.

The department of research is concerned with the launching of meat studies designed to furnish all possible information concerning the nutritive value of meat.

### Close Cooperation

While these eight departments each have their specific functions, very close cooperation is maintained, so that they collaborate jointly on many projects and thus lend greater effectiveness in securing results of far-reaching value.

A program of meat research was recommended in the original program of the Board. Every director was keenly aware of the need for research to secure authoritative information concerning the food value of meat.

It was decided that the Board should give grants-in-aid to educational institutions, the specific research projects to be conducted by college and university research workers. Within a year after the Board was launched, two grants for research were made—one to the University of Rochester, N. Y. and one to Columbia University in New York City.

Meat research has been continually under way for the past 26 years. A total of 70 grants have been placed in 26 colleges, universities and hospitals throughout the nation.

No matter how valuable the results of

meat research may be, they must be brought to the attention of the public. This is being done through a program of education and information which is reaching every part of the nation, and persons in every walk of life.

A few high lights regarding the nature of these phases of our program and the results achieved, may be of interest.

Among the groups which we feel must be reached with all possible facts about meat are homemakers, teachers and students, home economists, restaurant and hotel personnel, the medical, dental, dietetic and nursing professions; the retail meat dealers and others. These are the groups which are especially interested in food problems.

During the past year, thousands of homemakers were reached with information concerning the buying, preparation and food value of meat at 4-day cooking schools conducted in 50 large cities, and sponsored by daily newspapers. The attendance per school ranged from 1,000 to 6,000 daily.

This past year a meat merchandising program for retail meat dealers to help them with their selling problems, was conducted in 86 cities from coast to coast. In many cities, retailers drove in distances up to 100 or more miles to attend.

Programs teaching meat lessons to students and teachers were held in 126 cities of 37 states.

Some 40 educational meat exhibits were set up by the Board during the past year at state fairs, livestock expositions, food shows and other events. They were visited by approximately 2½ million persons.

In 1940 the Board introduced its first sound motion picture on meat. This film, "Meat and Romance" is still popular after 10 years. Another sound motion picture is "The Way To a Man's Heart". Hundreds of prints of these films are in constant demand. Our records show that these pictures featuring the buying, selection, cooking, carving and nutritive value of meat have been shown to date to more than 16 million persons.

We receive splendid cooperation from the nation's press. Special types of service are furnished to metropolitan papers and to weeklies and small dailies. The industry press is carrying the story of meat and keeping its readers informed concerning the Board's activities. Market papers, farm, livestock and breed papers and journals of

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Spots & Futures

### VEGETABLE OILS & MEALS

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the meat and grocery trade, make excellent use of our news copy.

Radio station personnel appreciate having our staff members on their programs as guest speakers. Much use is made of radio facilities by our field workers who conduct coast-to-coast programs. The records of the past year show that staff members gave 265 talks and interviews over 191 stations. In addition, we provide meat copy to the directors of homemaker radio programs, covering the entire country.

The Board is reaching the medical and other professions through a monthly publication, "Food and Nutrition News" which contains timely and interesting facts on meat and nutrition. Nutrition displays featuring the food value of meat are also installed at meetings and conventions of such groups as the American Dietetic Association, the American Public Health Association, the American Home Economics Association, dental associations and many others. Each display includes copies of the Board's nutrition literature.

Television has demonstrated its value as a medium for making meat knowledge available. During the past year, members of the Board's staff put on demonstrations in meat cutting, meat cookery and meat carving on 44 television stations. A total of 128 stations made use of our sound motion pictures in television programs.

The Board utilizes its facilities from time to time in conducting special campaigns for the industry as emergencies arise. Beef, pork and lamb campaigns have been conducted to help solve problems facing the producers.

Programs are conducted for hotel and restaurant operators in which emphasis is placed on quantity meat cookery.

We have a library containing thousands of pictures of meat cuts and cooked meat dishes. These are in constant demand by editors, authors, publishers and others.

We also maintain an experimental kitchen for the testing of meat recipes.

In 1926 the Board launched the first intercollegiate meat judging contest ever held. These contests are open to students of agricultural colleges and are held at livestock shows. At the last International Live Stock Exposition, students from 21 colleges and universities participated in these contests.

Staff members are called upon from time to time to address meetings and conventions of livestock associations and other groups within and outside the livestock and meat industry.

Last but not least, I would like to mention the role of literature in our meat program, and to call attention to various pieces of literature which are in constant distribution.

While much of our literature is given free distribution we also sell a great deal. It is sold at less than cost of production but we feel that sometimes literature is more appreciated when paid for than when it is given indiscriminate distribution.

Last year our sales of literature totalled between \$39,000 and \$40,000 dollars.

Through the years the Board has developed into a clearing house of information on all phases of the subject of meat. By mail, over the telephone and in personal calls, our staff is being constantly called upon for various types of services.

When Mr. Pollock outlined this program of work he had a vision of what should be done, and even though many of the activities were of necessity delayed, yet they have been developed as the opportunity has arisen.

It is not too difficult to set up a program. Many interests have set up programs but they have failed—were not followed out. It has been the pride of the National Live Stock and Meat Board that the program for meat has never been side-tracked for politics or for any interests not allied to the subject of meat.

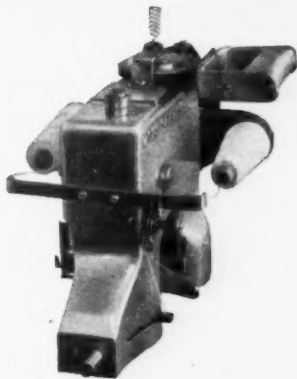
This story of the Board is not presented with any thought of boasting. It is the story of what an organization has accomplished, when backed by an aggressive industry which 27 years ago decided it was time to launch an aggressive program for its product.

If you were to ask Mr. Pollock what he believes to be the reason for any successes which may have been attained, I know he would tell you that it has not been due to his work and his staff alone, or to the fine work of an outstanding board of directors.

I am sure he would point out that at no time in the history of the Board has the livestock and meat industry failed to be squarely behind the organization. Never has any branch of the industry failed to re-

spond when called upon for assistance of any kind.

But that is not all. The progress of the program in behalf of meat has been stepped up and increased in its scope and magnitude because of the whole-hearted cooperation of interests outside of the industry. These are too numerous to cite in detail, but I am thinking in this connection of Boards of education, colleges and universities, the railroads, women's clubs, Chambers of Commerce, medical, dental and dietetic associations, the U. S. Department of Agriculture, managers of state fairs and livestock expositions, editors, publishers, authors, managers of radio stations, hotel and restaurant associations, and many others. All of these have served us in so many ways.



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## Bean Buyers at Tennessee Meeting



Here are a few of the interested soybean buyers who attended the recent meeting staged by the American Soybean Association at Dyersburg, Tenn. Eleven meetings were put on in the Midsouth to discuss production and marketing problems. Between 1,500 and 2,000 buyers and producers attended.

—Photo by Paul C. Hughes



J. P. WHITEHURST

## "MODERN" SOYBEANS: KEY TO "MODERN" MARGARINE

By J. P. WHITEHURST

Vice President, Miami Margarine Co.,  
Cincinnati, Ohio

IT IS A PLEASURE and an honor to present margarine's side of the soybean story to this convention—the 30th in a series. As many of you may know, margarine's part in the soybean story has not existed all of these 30 years. In fact, it was only about 15 years ago that margarine and soybeans got together.

Usually there has to be some reason for the presentation of any subject and some background behind the one presenting it, and for that reason, I believe you might be interested in the following remarks. Our company, the Miami Margarine Co., of Cincinnati, has been producing margarine for over 32 years. While there are two or three companies that are older in years than ours, we feel that we know as much about the production of margarine as any manufacturer in the industry. Today, we stand as America's largest manufacturer of margarine exclusively, and modern soybean oil has been one very important factor in assuming that place.

In all probability, the fact that we have worked closer with your Association than any other margarine manufacturer is the main reason why we have been honored by presenting margarine's side of the soybean story to this gathering.

Today, we have a plant, a product, and a laboratory that are as modern as anything in the industry. We are proud of the fact that in our plant, the first pound of modern margarine was produced—I shall enlarge upon this statement from time to time as I go along.

This was not achieved, however, until after many years of improving the product, which at first was unstable as the weather, and at different times in its history, was manufactured from just about every kind of oil ever processed—foreign and domestic alike. For more years than we care to admit, we had to wrestle with a product that was too hard or too soft, too bland or too salty, too difficult to produce or too costly to produce, and other

major problems that were fundamental to our present operation of getting a good product on the market at a very reasonable price.

We were never able to make a margarine that was really smooth—but even when we were able to produce just a relatively smooth margarine, it would break down if not properly handled. We had various troubles in flavor, stability, spreadability, and texture. But naturally I am happy to say that after years of experimenting, continuous research, and infinite patience, we were able to overcome each and every one of these stumbling blocks; and the result is that today we have a very fine product by all standards.

### Second to None

The taste and texture of our product have been developed to a point where they are second to none. Now each manufacturer is able to impart his own particular flavor and control of texture in his product through the process of manufacture. That is where soybean oil assumed a position of great importance in our business. However, more of that later.

It is with a great deal of pride that I tell you that in our plant the first basic continuous margarine machine was developed. This basic machine is now employed by all margarine manufacturers in the U. S. This was the first big step in the general improvement of margarine. This basic machine made modern margarine. It stopped the old-fashioned hand method of production and developed the automatic high-speed production line which margarine enjoys.

Immediately after this came improvements in packaging machines to keep up with the new increasing tempo of production. We also developed a new type blender which gave our product a texture and spreadability which we believe to be the finest in the land.

With but a few exceptions, all of these improvements were made available to the entire industry. But all the finest and most expensive machinery in the country would not have been sufficient for us to reach our present position if it had not

been for soybean oil and the desirable inherent qualities of this oil. At about the time that these improvements in the machinery end of our business came about, improvements in the refining of vegetable oils in this country were introduced. With the hydrogenation process, soybean oil became a real factor in the margarine business.

Situated as we were in Cincinnati, we were adjacent to the soybean belt and had access to the best refiners in the industry. Up to the time that modern soybean oil came along, it was often necessary for us to supplement other domestic vegetable oils with imported oils. Since the introduction of soybean oil, however, we have not found it necessary to return to off-shore oils; and in fact, it is a pleasure to tell you that in our opinion, off-shore oils will *not* be used in domestic margarine production. It is practically impossible to produce a good margarine from them with the machines which we have developed. They are ideally adapted only to domestic-type oils—soybean, cottonseed, and peanut oil.

Now naturally if our plant were located in the deep South where the supply of our sister oil, cottonseed, would be available at the proper price, it is very doubtful if I would be appearing here today. It is also necessary to inject one item of our own company's philosophy to complete the picture for you. From the beginning, our company has followed the policy that we should be interested only in producing the best margarine possible at the most economic price and letting distribution take care of progress first and profits last. There is no reason to present an itemized financial statement here, but I can assure you that we have every reason to believe that this policy has been sound, and it is the same one that we are following today.

Now, as you see, our geographic location gave us a natural advantage in using modern soybean oil in margarine; and we believe that we took advantage of this fact. It might be of interest for you to

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**CEDAR RAPIDS, IOWA**

know that we were one of the first two margarine companies to use soybean oil in the manufacture of margarine; and in so far as we know, were the first to use a 100 percent soybean oil base for a margarine. As a few of you know, we have pretty much carried the ball alone on soybean's story in the margarine field. This is no attempt to solicit sympathy, but it certainly is an attempt to seek your further support in promoting the value of soybean oil to the margarine industry; and the quality factor of soybean oil in margarine to the food trade and to the consuming public.

I would like to introduce a letter at this point—a letter that evidences for the first time the research committee's (National Association of Margarine Manufacturers) knowledge of the superiorities of soybean oil in certain aspects of manufacturing. Many of you may know of this letter, but I am not too sure that you recognize the importance of it in your relationship to the margarine industry. This letter at last places the soybean in fair competition with the cottonseed. In the comparisons which will be pointed out in this letter and demonstrated to you by charts, I believe you will be able to see how important the soybean is to our industry and will appreciate, as do we at the Miami Margarine Co., how, if in one or two cases soybean oil, through additional research, could become an ever increasing oil used by manufacturers of quality margarine in this country and particularly so in certain geographic regions.

This point of development may seem years in the future but there is no doubt that it can be speeded up by your desire to work with our industry and your desire to improve the handling of soybeans from start to finish so that each year modern margarine will reach the housewife's table in ever increasing freshness, flavor and smoothness. In can assure you of my company's sincere interest and can guarantee you 100 percent cooperation with your association in this undertaking.

Let us now turn to the charts and review them in light of the letter from the research committee of the National Association of Margarine Manufacturers.

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# Why a Futures Market IN SOYBEANS AND SOYBEAN OIL?

By EVERETTE B. HARRIS

Secretary, Board of Trade of the  
City of Chicago

**I**T IS WISE once in a while, I believe, to ask "why" in connection with matters which we see around us. If this question were applied to all current institutions and practices today we might greatly benefit as a nation. Fortunately we welcome the opportunity to turn a searchlight on our futures markets, particularly those in soybeans and soybean oil, which your question presents.

I shall attempt to divide my reply into two parts. You will want to know, first, why we believe the futures market, where adaptable, is the most highly efficient marketing system ever devised by man and one which gives producers and consumers manifold and rich benefits. Then you will wish to know why we feel that soybeans and soybean oil are two commodities which are singularly suitable for futures trading and how their distribution is facilitated by the price insurance which futures trading affords.

A grain exchange such as the Chicago Board of Trade is simply a market place. The exchange does not buy or sell any commodity nor does it record the individual transactions of members or their firms. All members, of course, have assented to and are strictly bound by the rules and regulations of the Association. Through our business conduct committee we have the right to check all trades to insure strict compliance with our rules. The Commodity Exchange Authority, similarly, polices all

commodity transactions on our exchange in the public interest.

There should be no mystery surrounding futures contracts because they are basically simple. There are two parties to a grain futures contract. One party agrees to sell and deliver. The other party agrees to buy and receive. The commodity is a certain kind and quality of grain. The contract specifies a month, a price, and other uniform conditions under exchange rules.

So much for the mechanics of trading. What are the economic implications? We know that professional speculators can and should survive only if their economic existence is fully justified by the service they render to farmers and consumers. It is obvious that the service of the speculator is rendered in connection with his activities in making our free grain market liquid—by standing ready to buy or sell any quantity of grain which is supplied or demanded for any of the authorized delivery periods. But to understand the futures market and these mysterious people we call speculators, we must understand the cash market.

## Speculators Needed

You people know, as many of the public with whom we often talk fail to understand, that the cash and futures markets are closely inter-related. And you know a futures market must have speculators. They are as essential to a market as a man is to marriage! And while men may not have as much social approval as women, they are indispensable to the highly approved social institution of marriage!

Justice Holmes in a Supreme Court decision once said, "Of course, in a modern market contracts are not confined to sales for immediate delivery. People will endeavor to forecast the future and to make agreements according to their prophecy. Speculation of this kind by competent men is the self-adjustment of society to the probable. Its value is well known as a means of avoiding or mitigating catastrophes, equalizing prices and providing for periods of want."

Despite the obvious truth of this statement and the clear necessity for speculators there is still much misunderstanding. For every so-called legitimate hedger in the market, whether he is a country elevator or a large miller, there must be someone on the other side of his transaction to offset his sale or purchase. In no other way can we have a free, fluid, and proper market. If our market were not liquid at all times, willing to give or take any quantity

of grain with only one-eighth to one-fourth of a cent change at a time, it would not be effective. Without speculators we cannot have a liquid market.

As you know, a futures market is designed to furnish price insurance for the cash grain trade. It is not the mechanism for the distribution of grain. True, many deliveries of grain are actually made in public warehouses in Chicago at the termination of futures contracts. Delivery must be made, and is always made unless the individual in the market has liquidated his position by an offsetting sale or purchase prior to the termination of the contract. We must always have the possibility of actual delivery in our contract to keep it from being meaningless. But it would be no more logical for each holder of price insurance in our market to use our delivery privilege in every case than it would be for the owners of real estate to dispose of their property through burning the houses to obtain fire insurance payments.

The futures market is the instrument which makes hedging possible. Hedging is a process of trading in the futures market which enables the buyer or seller of grain to obtain the equivalent of insurance against loss through fluctuating prices, which are inevitable in the case of grain. He accomplishes this by offsetting a purchase or sale of cash grain with a sale or purchase of a like amount of grain in the futures market. For example, the process of hedging permits the country elevator to buy grain from a farmer on a safe and narrow margin of cost and profit, which in turn enables it to pay the farmer more for his grain than otherwise would be possible; and it enables the merchant or processor of grain to reduce his risk to such an extent that he is able to make grain products available to the consumer every day in the year at a lower cost than otherwise would be possible.

On the matter of marketing costs, Technical Bulletin No. 934, published by the U. S. Department of Agriculture in Aug. 1947, records results of a survey which found the cost of marketing grain to be less than any other agricultural product. The study revealed that 1.7c out of the consumer's dollar which is spent for bakery and other cereal products pays all the costs of marketing the grain that goes into such products.

You and I know that real competition at every level of distribution for grain products for human needs or for livestock, from the farmer through processing distribution to the ultimate consumer, accounts for the

EVERETTE B. HARRIS





high efficiency we have in the industry in this country. Our market operates on extremely low commissions both in the cash and futures departments. In the cash market our commission merchants charge 1 percent of gross proceeds of sales of grain. Our futures people charge non-members \$18, in and out, for each 5,000 bushels of grain. In the case of soybeans, this means that you can have a contract worth \$12,500 purchased and sold for \$18. Profits in all segments of the grain business are dependent upon a large volume of grain being handled in an efficient manner.

### Producers Could Use It

Incidentally, although I am not here to solicit business for our members, I should point out that there are numerous circumstances under which our futures market may be used by producers advantageously.

First, it has been inferred by some that farmers cannot take advantage of high prices when they do exist on the Board of Trade. This is obviously false, since any farmer can sell his grain any day of the year in advance and guarantee himself the price quoted that day. Later he can actually deliver the grain or, if he prefers, buy back his contract if a lower price is quoted later.

Second, there are times when a soybean grower might wish to use storage space for corn or some other commodity. In this situation he can sell his actual cash beans and buy a futures contract if he feels that the price will go higher. In this way it is unnecessary for him to hold the actual

beans in anticipation of a higher price. Furthermore, in this manner he avoids the danger of insect damage or other deterioration which can occur to grain in storage.

The Exchange has absolutely no influence on price. The Exchange provides and supervises the market place where sellers offer grain for sale and where buyers come looking for grain to fill their needs. There are many buyers and sellers in this open and competitive market. Futures prices are established by bids and offers which the rules of the Exchange and federal law require must be submitted by open outcry in the pit. Thus all buyers and sellers have access to all bids and offers; and the public is kept constantly informed of the prevailing grain prices through the widespread publication and radio distribution of current market quotations, both cash and futures.

The benefits of hedging, which is made possible by speculation, are many—they go back to the farmer himself. Actually, because of hedging, farmers get higher prices for their grain.

Millers and processors buy and store millions of bushels of grain each season. On inventories that large they can't afford to take the risk of a price decline—their loss would be too great. If those firms were to assume their own price risks they would have to build up or set aside a reserve to absorb any such possible price losses. That would be their margin of risk—it might amount to 15c on the bushel, it might at times be 10c per bushel, or at other times 20c or 25c per bushel. It would sim-

ply be included in over-all marketing costs. But with a futures market, those soybeans can be hedged—price insured against possible losses. There is no need for the reserve—over-all marketing costs are just that much lower.

All grains, of course, are very seasonal—the whole year's supply could become available all at once, right at harvest time. Yet demand for grain goes on throughout the entire year. Some medium had to be found to take the impact of these large marketings at certain seasons and carry them through the year, making grain available whenever it might be needed. Futures markets do this. Futures markets permit the orderly distribution of a 60-day crop over 365 days of the year. Because industry and storage people can hedge or price-insure their holdings in the futures market, they can afford to buy up the excess of the harvest whenever it comes in. This has resulted in the development of large storage facilities in central markets.

And so you see, neither the farmer nor the country elevator operator has to go out to find an individual buyer for his grain. They look only to their public marketplace for the demand which gives them a constant market—a year-around market for their seasonal commodities.

It's important, too, that everyone interested in grain knows what prices are, and so the Board of Trade publishes them all during marketing hours. Prices are public information. In the old days, farmers often suffered because they couldn't be sure they were getting a fair price. There was no



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Many soybean processors recently have installed the improved Carter Millerator. Their figures prove that the new Millerator cleans better, helps increase production, earns bigger profits. Used before the soybeans are processed, the upper screen of the Millerator performs a refined scalping, removing material larger in diameter than the beans handled, and much of the material substantially longer. The lower screen removes small seeds and sand, and is sometimes used to remove splits. Light foreign materials are effectively removed by controlled aspiration. The all-metal machine is easy to control, uses a minimum of power. For more efficient cleaning, more profits—install the improved Carter Millerator.

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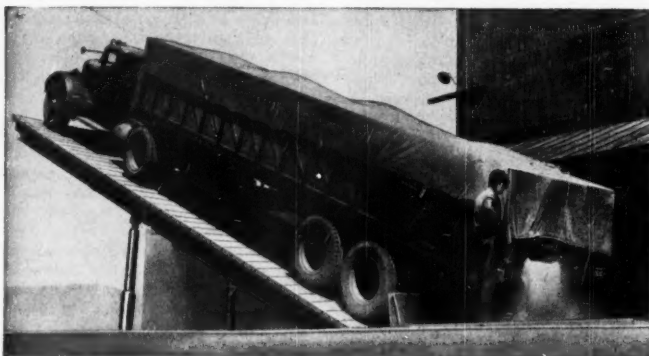
Minneapolis 19, Minnesota

way of spreading information about the prices other sellers were getting. Prices differed widely at places only a few miles apart.

Before discussing the adaptability of soybeans and oil to futures trading, I should like to touch briefly on the appropriateness of Chicago as a location for futures trading in agricultural products. It just happens that approximately two-thirds of all agricultural production takes place west of Chicago; similarly, about two-thirds of consumption lies to the east of our city. A great railroad center where all freight rates break, Chicago is, of course, on Lake Michigan, and all warehouses regular for deliveries of futures contracts must be on water. Buyers may remove grain by rail

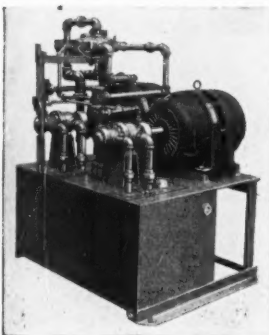
or boat and there is no extra railway charge for grain which "stops over" in a Chicago elevator.

The primary requisites of a commodity suitable for futures trading are: uniformity, standard grades, storability and wide usage. Both soybeans and their oil derivatives meet these qualifications. Many other products such as clothing and houses fail to meet these tests although cotton, wool and perhaps lumber do qualify. The producer of a commodity adapted to a continuous auction type of marketing, which is really all futures trading amounts to, is indeed fortunate. He benefits from the efficiencies of this system because he avoids all advertising and many other distribution costs.



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**KEWANEE MACHINERY & CONVEYOR CO., Kewanee, Illinois**

Before discussing soybeans, I should like to say that our market in soybean oil which was recently initiated gives great promise of being beneficial to the producer of soybeans. Our volume to date has been encouraging, and we have no doubt that it will continue to grow and be maintained as a liquid market for processors who wish to hedge either purchases or sales.

Soybeans were first traded on the Chicago Board of Trade late in 1936. Trading continued until February, 1943. From this date until March 1947, there was no trading due to federal restrictions on soybean purchases. Since 1947 trading has been brisk, in the opinion of some, too brisk!

There have been certain statements from high quarters of late referring to excessive speculation in soybeans. These alleged excesses have been discussed in a report by the CEA, in an editorial in the August issue of the Soybean Digest, and perhaps elsewhere. We must agree with the Digest that if we need additional controls they should be imposed by the futures markets themselves rather than the government.

### CEA Report

The Commodity Exchange Authority Report on "Current Speculation in Commodity Futures" dated July 31 referred to four subjects. First it discussed the increase in volume. The increase in volume referred to in the report as occurring between June 25 and July 28, of 98.2 percent in lard, 78.6 percent in wheat and 28 percent in soybeans, was widely misinterpreted in the press. It was almost universally referred to as an increase in speculation when it was actually an increase in over-all trading.

The fallacious concept that an increase in speculative activities means higher prices is naive on its face and has often been disproven by factual data. Furthermore, the absence of a large volume of speculation in a market invariably results in more violent fluctuation, either up or down, than results when the effects of supply and demand are anticipated and somewhat absorbed by speculation in futures contracts.

To point to a large or increased volume of trading as harmful indicates either a lack of familiarity with the greatest economic system ever devised or a mischievous desire to abandon our proven system and join the ranks of "experimenter" nations elsewhere in the world.

Section 2 of the CEA report referred to the increased volume as accompanied by price advances. Price increases for commodities traded on the Chicago Board of Trade from the start of the attack on Korea until July 28, were reported as 6.6 percent in the case of December wheat, 25.7 percent for November soybeans, 5.0 percent for September corn and 41.0 percent for September lard.

It is not surprising that prices of commodities increased in the face of a possible third world war. For prices either spot or futures to do otherwise would be to defy gravity or stop the tide. Price increases in anticipation of advent of war are not new. Nor are such increases confined to futures contracts. As a matter of fact, prices of lumber and other cash commodities have in-

creased in many cases more rapidly than commodities which are traded in futures markets. Since July 28, the date used in measuring the increases for the CEA report, prices of wheat, corn, soybeans, and lard have tended to decline.

Section 3 of the CEA report deals with the low margin deposits required for speculation in commodity futures. To compare margins required for commodity trading with those set for securities trading is unfair, unrealistic and erroneous. Stocks are purchased primarily for investment purposes. The use of margins for grain trading, by either hedgers or speculators, is almost entirely different. Hedgers use the market for price insurance purposes and speculators must stand ever ready in a liquid market to offset either a sale or a purchase by the hedging interest. In grain trading a margin is merely earnest money to insure performance of a contract for later delivery of grain. By hedging grain on relatively low margins, a processor may not only obtain price insurance on his inventory but may also obtain a much more liberal loan from bankers, often up to 90 percent of value, than would otherwise be possible. If he were required to put up the full amount of the value of the grain as margin, this would obviate the advantage of the inventory loan which contributes so much to the efficiency of his operation.

To set unduly high margins on grain trading would not prevent price changes on grain either up or down. In fact, it might

so impair the liquidity of the market by virtually eliminating the necessary speculator that price changes would become violent. Every competent study of futures trading for the past 100 years has emphasized the stabilizing effect on prices resulting from these contracts. Elimination of speculation in grain would result in much less ability of the markets to absorb heavy harvest sales by farmers at stable prices, would mean wider price fluctuations, would eliminate the advantages of a hedging market, and would inevitably mean higher marketing costs. This would work to the obvious disadvantage of both producers and consumers of foodstuffs.

The fourth and final section of the CEA report discussed futures trading as being predominantly speculative. The table in this section of the report would seem to indicate that from 81 to 86.6 percent of the wheat trading and from 90.7 to 96.5 percent of the soybean trading was speculative rather than hedging. Even if this were true it would not necessarily be harmful. It would be difficult if not impossible to determine the degree of speculation which is "excessive". Too little speculation would be more easily defined as a point at which large hedges could not be readily disposed of without unduly affecting the price. No experienced analyst has been known to complain of a market being too fluid for efficiency.

A second look at the figures in this report, however, shows that they are based

upon the number of trades, not upon bushels. One can only believe that this is intentional since an earlier report of the CEA (covering soybean trading as of March 27, 1950) showed both bushels and accounts. The text of this earlier report indicated that 86.6 percent of the trading was speculative. An analysis by bushels, however, told a different story.

This proper analysis indicated that there was less than three speculators to one hedger on a bushel basis. This could hardly be called excessive speculation! Obviously it would take many small speculators with 5, 10, or 25 thousand bushel commitments to cover one large hedger with perhaps 500,000 bushels.

In conclusion, I should like to point out that the National Soybean Processors Association, at its annual meeting in Chicago earlier this month, passed the following resolution:

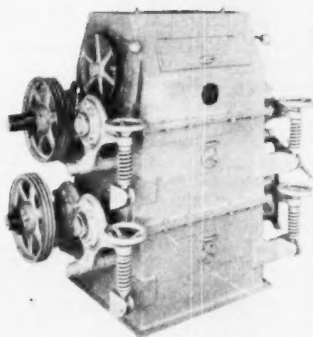
"1—We are opposed to government control of margins on soybean futures and all other commodity futures. We believe that such action would place responsibility in inexperienced hands and place an unnecessary restriction on the operation of the futures market, thus making legitimate hedging purposes there less effective.

"2—We urgently request prompt consid-

(Continued on page 74)

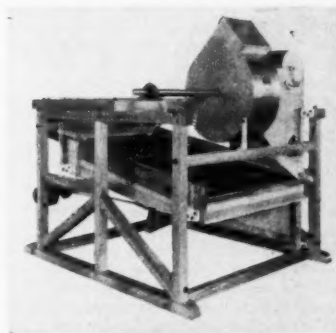
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R. G. BRIERLEY

**T**HIS CONVENTION has extended me the privilege of speaking on previous occasions on the important subject of soy flour and its place as a low-cost, high quality protein food, commercially available in this country.

I have no intention of repeating the basic story. Instead I want to show you, through an analysis of the soy flour status in Germany, how closely the prospects for our product are connected with the international situation. By this analysis, I hope to point the need for some fundamental changes in Washington thinking if our industry, and the soybean crop, is to take its proper place in the food planning for emergencies that are certain to be ahead of us.

The only bright spot that I see in the present Korean situation is that our country as a whole is waking up to some of the grim realities of the international situation. The military preparedness that Washington told us was being bought with billions of tax dollars looks painfully sad in the light of recent disturbing developments. The errors and inconsistencies of our foreign policy are coming home to many of us as we see Russia chopping away at us through her satellites, and striving to transform Yalta, our China policy, and our Western European policy into a colossal world joke, discrediting in the eyes of all people. The attempt is not without some success.

Part of our Western European policy involves soy flour in a way that makes it necessary for me to discuss it in order to present a fair evaluation of our prospects for selling soy flour in Germany and in part taking the weight off this meal market that we face in the next crop year as the result of the record production in prospect.

I speak as a disturbed individual who has had the privilege of spending 6 months in Germany and Europe in two concentrated trips in 1948 and 1950. I have traveled 5,000 miles in Germany with an exceptional interpreter and friend and talked to hundreds of Germans who represent-

## SOYBEANS ABROAD

# Soy Flour in GERMANY

By R. G. BRIERLEY

Asst. Vice President  
Archer-Daniels-Midland Co.

ed government, agriculture, industry, consumers and unions. Through that experience I am convinced that Germany today is living proof of our inability to pursue our postwar objectives as effectively and intelligently as we sought military victory in World War II. We have improvised and side-stepped and drifted from one crisis to another in Germany to the prejudice of our national standing in Europe and in our particular situation and the prejudice of the case for soy flour in the German Food Economy.

Let's get down to cases by analyzing the history of our shifting policy in Germany as it affected soy flour.

### Conflicting Opinion

Out of the smoke at the end of the war emerged conflicting American opinion on peace in Germany. There were those such as Henry Morgenthau who wanted to reduce Germany to a mere agricultural nation stripped of every possible industry that could be used for war, and others who saw communism as such a deadly issue that they wanted to rebuild and rearm Germany as a bulwark against communism. The final Washington decision was a compromise. We dismantled in part, denazified in part, and talked big while we set up a military government with wide powers. But we also tumbled all over ourselves to get troops out of Germany. We gave military government lots of authority, but stripped it of everything with which to enforce its decisions. We asked men like Clay and Stanley Andrews to solve the problems of Germany when that country was in rubble, without giving them the necessary tools and without backing them up with any sound consistent policy. We let Russia bluff us with the colossal hoax of Berlin, and then when we were in an untenable position, a position that our own German experts had warned us against, we grandstanded with the air lift. We let the Russians draw us into a trap that sapped some of our strength through the airlift. It was a trap baited with our own ineptness, and our gross inability to face reality. Between Berlin and Korea we have a sorry record of blunder on blunder and a dismal absence of consistent policy.

It was during those critical days of military government that soy flour was first shipped to Germany. Congress appropriated billions for rehabilitation feeding. It was done a little hysterically, as we seem to do things. And then suddenly Washington woke up to a severe flour shortage. Soy flour, which had been crying for recognition in the food program for months, was taken over in huge volume for an industry its size, and we were asked to produce and ship 150,000 tons of soy flour to Germany. Although we had recommended that the soy flour be incorporated in wheat flour, it was sent from here as soy flour. When we suggested that our experts would assist in seeing that the product was properly used, we were told that the army experts knew all about it and would ably take care of the situation. It was not until first Ersel Walley, and then myself went to Germany that we learned that neither the Germans nor the military occupation authorities knew about the soy flour until just before it arrived, and neither knew how to use it.

### Soy Shut Off

To further emphasize the hysteria that characterized this period, soy flour shipments were just as suddenly shut off when Congressional pressure forced potato flour on the army. Potato flour in the millions of pounds was shipped to Germany, which then abounded in potatoes and carbohydrate foods, at a cost to the American taxpayer of twice that of soy flour.

Out of this period evolved a new policy of building up Germany—curing unemployment became more important than the fear of another warlike Germany. But at the same time we entered into the tri-partite control of Germany. We teamed up with England and France even though it was their avowed purpose to reduce Germany forever to a second grade power, which would never again compete politically or businesswise with the rest of Europe.

The U.S., again imbued with undirected altruism, and with the idea that pouring money into Germany would cure all ills, became the financial partner of France and England, which in turn became the administrative power because they voted together



on most important issues. Germany was able to play one against the other and the allies, holding only veto powers, were forced to let Germany go pretty much back to her own economy and her own bleak philosophy.

During this period the German food ministry was interested only in building up meat production for psychological and political reasons. There still remained large stocks of soy flour which had backfired when it was added at high levels to bread containing levels of corn flour and potato flour and peanut flour that made the bread unpalatable. Rather than use the soy flour in small recommended levels, to bring real nutrition to the lower income people, it was finally decided to feed it to animals. And the American taxpayer paid for that colossal misuse. For a rich country it might have been excusable, but for a country in as desperate need as the Germany of 1948 and 1949, it was utterly unpardonable.

You might ask how this could happen. It happened because there was no power in the Allied command to enforce common sense, no mechanism set up to see that the soy flour was used as a life-saver for many people. The golden opportunity of the desperate food situation of '48 and '49 was lost again to the irrevocable damage of the soy protein idea. Our policy, our common sense, our refusal to bow to traditionalism, our calm appraisal of the desperate need did not follow our dollars. Our administrators were virtually powerless to do anything.

### Were Fed Up

Why did men like Clay and Stanley Andrews leave Germany during this period? I would venture a guess that they were fed up with the Washington policy that gave them no means to treat with the serious problems that faced Germany—sick at heart because realistic policy didn't follow our money.

In 1949 ECA took over in Germany with the unexpended GARIOA funds appropriated by Congress and in combination with the State Department.

Again the policy was to turn Germany back to the Germans as fast as possible. ECA administrators were asked simply to screen requirements that were initiated by the Germans, and to help solve the economic

problems without interfering with internal politics. Much-needed reforms were proposed, but without the power of enforcement. Tariffs and cartels which are both ruinous and fundamentally hindrances to economic recovery, have not been eliminated because of the political repercussions, even though this would have been the soundest kind of economic policy.

We are still temporizing with the decision to give Western Germany an armed police force. With Russia sitting in Eastern Germany with a mammoth police force, what in the world are we waiting for? Must they draw a blue print for us? The Russian-owned National Congress met in Eastern Berlin this last weekend and adopted a resolution comparing the southern Korean government to the "traitors in Bonn". Can there be any doubt that only force and preparedness will eventually keep Western Germany free of armed aggression? If they march in tomorrow, Western Germany would have no alternative but to be absorbed in the Russian orbit. Not all the billions we have poured into Germany would prevent just that for one moment.

At first thought one might wonder at the logic of associating the overall foreign policy with so comparatively minor a matter as the single product, soy flour. But bear in mind that similar consequences may be found in other industries and some reach deep into the economy.

Accordingly, it is high time that someone from industry speak out boldly with the thoughts that are held by many Americans. These thoughts are, basically, that it is time that Washington spent money where money can do the most good. It is time that government agencies controlling such money should leave the beaten tracks, the easy roads of conformity, and begin seeking economy in the interests of the taxpayer.

Such economy could definitely be found in large usage, through ECA funds, and through other channels, of soy protein, a low cost product that right now should be added at least to the extent of 3 percent in the wheat flour used in Western German bread. There are innumerable other logical places for its usage, and one of the mysteries in the soybean industry is the failure of ECA in all this period, during which it has spent millions and millions of dollars for various edible proteins, many in finished

form, to almost studiously avoid the most economical product available.

Incidentally, your able secretary, Geo. M. Strayer, Edward J. Dies, and myself recently discussed this general subject in Washington with Dr. D. A. Fitzgerald, food chief of ECA. We requested a policy statement for this convention, as had been requested by many of your members. We are still waiting for such a statement.

All the soybean growers through the great producing belt realize that with such an enormous crop all possible outlets should be developed. The industry as a whole recognizes that 150,000 tons of soy flour which could be used in the Western German bread, during the new crop year, would be substantial assurance that prices would hold fairly firm in the season ahead. They have a right to expect reasonable cooperation, and as has been frequently remarked at this convention, unless the right type of cooperation is forthcoming, the next appeal will be to congressmen.

### End Double Talk

The stage has been reached where this industry as a whole must plan its efforts with unity and determination. When it is so clearly apparent that reasonable attention on the part of certain public servants could conceivably prove of permanent advantage to large numbers of agrarians in the development of new outlets and markets, then it is important that such public servants be asked to state their position clearly, without hedging, without double talk, and in language that the intelligent and realistic farmer can understand.

Soy products—flour, meal and oil—have been miserably treated in this period when the United States has been trying to be good brother to nations across the world.

As indicated earlier the lack of sound logical foreign policy has contributed in large measure to the neglect of soy products by Washington. Such neglect may continue. As implied previously, many feel that the time is approaching when the non-political policy of the whole industry, which incidentally is unique for an industry so large, must be altered and changed to an aggressive policy, a determined policy, to see fairness and equity brought into action and kept in action.



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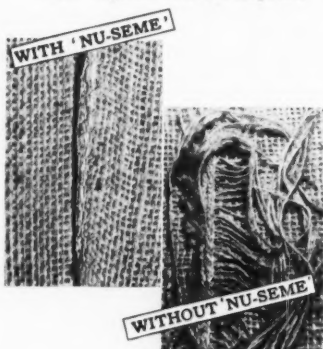
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## GOVERNMENT

# 1949 GRAIN STANDARDS

## Their Effect on Soybean Marketing

By HAZEN P. ENGLISH

In Charge of General Field Headquarters,  
Grain Branch

**M**OST OF YOU will recall that the official standards of the United States for soybeans were amended effective Sept. 1, 1949. The principal change made in the standards at that time was the abolition of the dockage system and the combination of the previously considered dockage material with foreign material as one factor. Trade sentiment at that time seemed to be preponderantly favorable toward making such a change and the percentage limitations adopted seemed to be a desirable compromise between the various suggestions and the production possibilities.

It was our thought then that if soybeans were shipped to terminals in the same condition in which they had been received in previous years, we could expect a higher percentage to be degraded on foreign material than previously.

An examination of the information we have gathered does not indicate that this has occurred. For the 1948 crop year 22 percent of the inspected receipts graded No. 1, 52 percent No. 2, and 20 percent No. 3. This was under the dockage system and with a limit also of 1 percent foreign material in No. 1, 2 percent in No. 2, and 3 percent in No. 3.

A study of the receipts from the 1949 crop at six selected important soybean markets indicates that 71 percent would grade No. 1 with not more than 2 percent foreign material, and 19 percent would grade No. 2 with not over 3 percent foreign material.

This total of 90 percent of the crop falling in the two upper grades on this factor and containing not more than 3 percent foreign material compares very favorably with 94 percent which graded No. 3 or better in the previous crop although dockage was assessed on a great many carlots in the previous year.

A further study of the foreign material figures for the 1949 crop indicates that 32 percent of the receipts contains 1 percent or less foreign material. This is approximately one-third of the crop as received at terminals. There is, however, some variation between areas in this respect. At Toledo and Cedar Rapids 50 percent of the receipts fall in this category with 1 percent or less foreign material; at Chicago 40 percent and at Decatur, Illinois 25 percent. The figures for Decatur, however, do show that 65 percent of

the receipts contain 2 percent or less foreign material.

The information above regarding the 1949 crop is based on foreign material studies alone. An examination of further statistics shows that approximately 35 percent are actually grading No. 1 and 45 percent No. 2. This would indicate that approximately 10 percent of the crop as received may be grading below No. 2 on factors such as splits, moisture, etc. This seems to be about a normal amount to be so graded.

The increases made in the percentage of splits allowed in the numerical grades below No. 1 have apparently had no noticeable effect on the grading of this crop. This is not ordinarily considered to be a serious deleterious factor unless present in abnormally large amounts in storage. And we have heard no unfavorable comment from any segment of the industry regarding the present practice of grading as yellow soybeans those green varieties which are yellow colored in cross-sections.

We informed your organization at your meeting a year ago that we would be interestedly watching the way these revised standards worked on the 1949 crop. The figures given herewith represent a resume of that study. We will continue to welcome your constructive criticism of the standards and your suggestions for their improvement.

— s b d —

### HARRIS

(Continued from page 71)

eration of multiple deliveries on the soybean futures markets under the supervision of the Chicago Board of Trade.

"3—We also urgently request immediate maximum speculative limits on soybean futures in line with limits already established on grains."

We realize that our market as it stands today is the result of development, progress, and change. We always welcome suggestions from producers and processors as to how our market may better serve them. Naturally, these suggestions by the processors will be given full and serious consideration. Similarly, we always will welcome constructive comments from producers as to how we can improve. But we hope to work out these changes in the future as in the past within the framework and climate of American free enterprise—not in the stifling atmosphere of bureaucracy.

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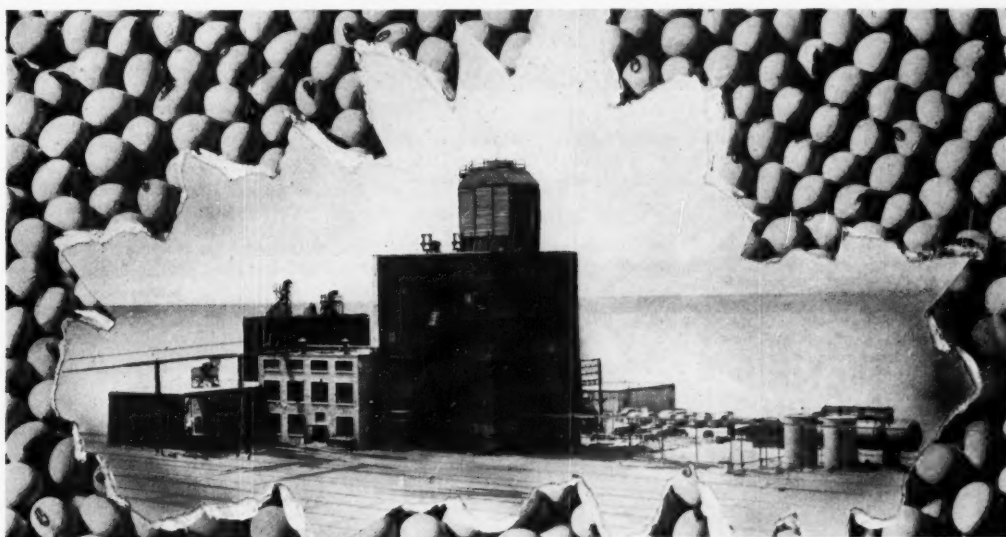
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INQUIRIES INVITED

### New Chicago plant increases Cargill facilities and service



**NEWLY COMPLETED IS CARGILL'S LARGE, MODERN** solvent-process oil extraction plant on the far southside of Chicago—located so it can best serve the rich soybean-growing area of the Central United States. The new plant is equipped to receive

beans directly from boxcars, trucks, or barges. This centrally-located addition to Cargill's oil and meal facilities again steps up Cargill's ability to serve feed manufacturers and soybean oil refiners promptly and economically.

# GRITS and FLAKES...

FROM THE WORLD OF SOY

Demand of the paint industry for a medium soya oil alkyd solution at a higher viscosity range has resulted in the commercial development of such a resin by the Plaskon division of Libby-Owens-Ford Glass Co. It has been designated Plaskon 3187.

Atlas Mineral Products Co., Mertztown, Pa., has announced the appointment of Dr. Robert H. Steiner as research coordinator. He has been employed by the Firestone Tire and Rubber Co. for the past 7 years.

Chicago Board of Trade has declared oil storage tanks at the Kankakee, Ill., plant of the Borden Co. to be regular for delivery on crude soybean oil futures contracts for the period to June 30, 1951. Borden has oil storage capacity of 450,000 pounds at Kankakee.

*Jonesway Gin Co., Kennett, Mo., is building a 220,000-bushel steel building for soybean storage.*

W. A. Hemphill, president of Hemphill Soy Products Co., Kennett, Mo., has announced the addition of 15 14,000-bushel tanks to the firm's storage.

The new Essex Grain Co., Essex, Mo., will be ready for business this fall as soon as its 150,000-bushel elevator is completed.

"Crown-Safe-Solvent Process" is a new bulletin and flow sheet describing the trichloroethylene solvent process of Crown Iron Works Co., 1221 Tyler St., N. E., Minneapolis 18, Minn.

*Jeret Gilbert, Perthshire, Miss., is building elevators at Perthshire and Rosedale, Miss.*

"Soybeans—The Farm Crop with a Future," is title of a folder recently issued by National Soybean Crop Improvement Council, 3818 Board of Trade Bldg., Chicago, Ill.

Marriage of E. K. Ludington, Jr., Chase Bag Co. vice president, and Mrs. Constance Richards of Southern Pines, N. C., took place recently at Greenwich, Conn.'s Round Hill church.

"Bulletin No. 27" describing the Sprout-Waldron carloader is available from the advertising department, Sprout, Waldron & Co., Inc., Muncy, Pa. It is recommended for handling bulk grain, chemicals, fertilizers or other pulverized, granular, free-flowing materials.

*Riverside Oil Mill, Marks, Miss., is building additional 180,000-bushel storage for soybeans. W. K. Self is manager.*

## CHANGES BY SWIFT



E. C. McGEE

Changes in Swift & Co. oil mill management have been announced by S. E. Cramer, head of the oil mill department.

E. C. McGee, manager of the company's oil mill at Des Moines, Iowa, has been transferred to the district office at Memphis, Tenn. C. D. Whitaker, sales manager in the feed department at the Dallas district office, will replace McGee at Des Moines, and Joe Adams of Fort Worth will replace Whitaker.

McGee joined Swift & Co. in 1927 as an accountant at the Atlanta, Ga. refinery. In 1941, he moved to the Chicago General Office as assistant manager of the oil mill and refinery accounting department and in 1943 was transferred to the oil mill department.

Whitaker was placed in charge of

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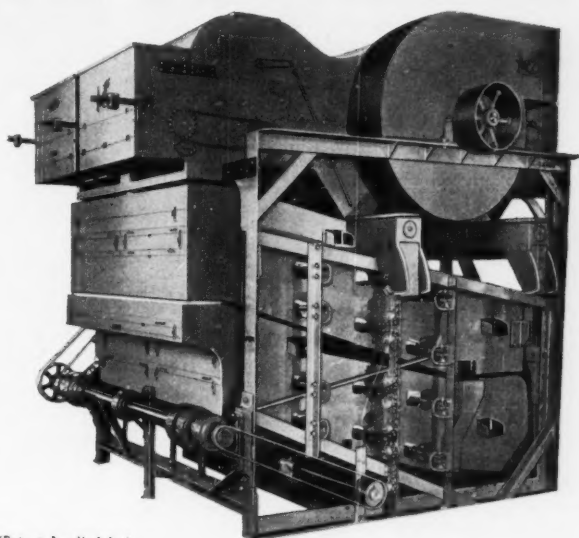
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Bluxome St. BALA CYNWYD, PA.—H. J. GRIFFIN, P. O. Box 141.

Arid-Aire Manufacturing Co., maker of grain dryers for elevators, has moved its general office to new and larger quarters at 3981 Zarthan Ave., Minneapolis 16, Minn. The plant continues at Litchfield, Minn.

"Bulletin No. A-470" describing the new "Torque-Arm Speed Reducer," newest addition to the line of power transmission equipment of Dodge Manufacturing Corp., Mishawaka, Ind., may be had by writing that firm.

A coil spring filter suitable for filtration of a wide range of products including soy protein is manufactured by Komline-Sandersen Engineering Corp., Peapack, N. J.

*Farmers Seed & Feed Co., Lake Providence, La., is building a new elevator.*

Ralston-Purina Co. will build a new "Chow" manufacturing plant at Richmond, Ind. An elevator with 90,000-bushel storage capacity will be erected. Jones-Hettelsater, Kansas City, Mo., is the contractor.

Robert S. Dunlap has been appointed southeastern division sales manager of the Glidden Co.'s Durkee Famous Foods Division. He will be responsible for the sale of margarine and salad products in the area served by the new Durkee margarine plant in Macon, Ga.

R. S. Aries & Associates, New York consulting chemical engineers, announce that Dr. C. E. Simpson has joined the organization as senior associate. He is a Canadian of extensive experience in the consulting field.

*Martin Grain & Elevator Co. will be ready for business this fall at Shaw, Miss.*

The recently developed "S-A Box Car Unloader" handles practically all bulk materials that are moved in box cars. Write for "Bulletin 549" from the Stephens-Adams Manufacturing Co., Aurora, Ill.

The new Chicago sales office of Mente & Co., Inc., recently opened at 2425 Lawrence Ave., will be in charge of George J. Loerzel, assisted by his son, George J. Loerzel, Jr. Mr. Loerzel senior has represented Mente in the Chicago area for the past 11 years.

Hunter Goodrich has been appointed specialist in cash vegetable oils and meals in the commodity division of Merrill Lynch, Pierce, Fenner & Beane. Goodrich has been associated with Archer-Daniels-Midland Co. for 25 years, most recently as manager of the firm's plant in Edgewater, N. J.



Eight oil mill managers with a total of 100 years of oil mill experience with Swift were honored recently by Vice President C. T. Prindeville, in Chicago. Prindeville is cutting the "centennial" cake served at a luncheon. Seated, left to right: N. F. Noble, manager at Champaign, Prindeville, and Sam Hollett, manager at Frankfort. Standing, left to right: E. C. McGee, manager at Des Moines; H. B. Parker of the Chicago oil mill department; S. E. Cramer, head of the oil mill department; H. S. Byrd, manager at Fosteria; J. L. Gunn, manager at Elytheville, Ark.; W. B. Stone, manager at Cairo, Ill.; and F. A. Norris of Prindeville's Office.

the feed department at Dallas in March, 1947, after having 14 years of experience in the oil mill business. He began as a production employee and later served as foreman, sales clerk, cashier, seed buyer and then plant manager.

Adams will work under the Southwest district office of Swift & Co., which is headed by E. F. Czichos, but will continue to make his home in Fort Worth.

— s b d —

## NEW MOISTURE TESTER

The new model Universal Moisture Tester, just made available to the trade by the Burrows Equipment Co., 1316 Sherman Ave., Evanston, Ill., is especially designed to test grain of high moisture content. It will instantly give a direct moisture percentage reading on a dial up to 40 percent. Higher readings may be obtained with use of charts.

The instrument is fully portable, consistently accurate and extremely simple to operate. A built-in thermometer automatically indicates temperature of sample, thus eliminating the need of a separate temperature test. Although it operates by electricity, no electrical outlets or batteries are required.

— s b d —

## STALEY BUILDS

Plans for the construction at Painesville, Ohio, of a modern soybean processing plant with a daily capacity of 10,000 bushels have been announced by officials of the A. E. Staley Manufacturing Co., Decatur, Ill.

The new plant will use the solvent extraction process and will replace an older Expeller plant which the company has operated at Painesville since 1939. It will have 25 percent more capacity than the existing facilities.

Staley officials said all major equipment for the new plant has been purchased and a large engineering force assigned to the project. Actual construction work is expected to start in January or February, with completion scheduled for the fall of 1951.

The Painesville extraction plant will be the third of this type built by the Staley Co. The company built its first at Decatur in 1945 and is currently completing its second.

— s b d —

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## DURKEE MANAGER



GEORGE F. ATKINSON

Appointment of George F. Atkinson as general manager of the Durkee Famous Foods Division of the Glidden Co., is announced by Dwight P. Joyce, president.

Formerly executive assistant to the president, Atkinson was transferred to the Glidden headquarters staff in January of this year from his position as manager of the Durkee plant and refinery in Louisville. A native Ohioan, he has served Durkee Famous Foods ever since his graduation from Ohio Wesleyan University in 1929.

Joyce said the appointment was made as part of a move to expand the marketing and distribution of Durkee branded and bulk food products. In his new capacity, Mr. Atkinson will be responsible for all operations of the important Durkee Division of Glidden.

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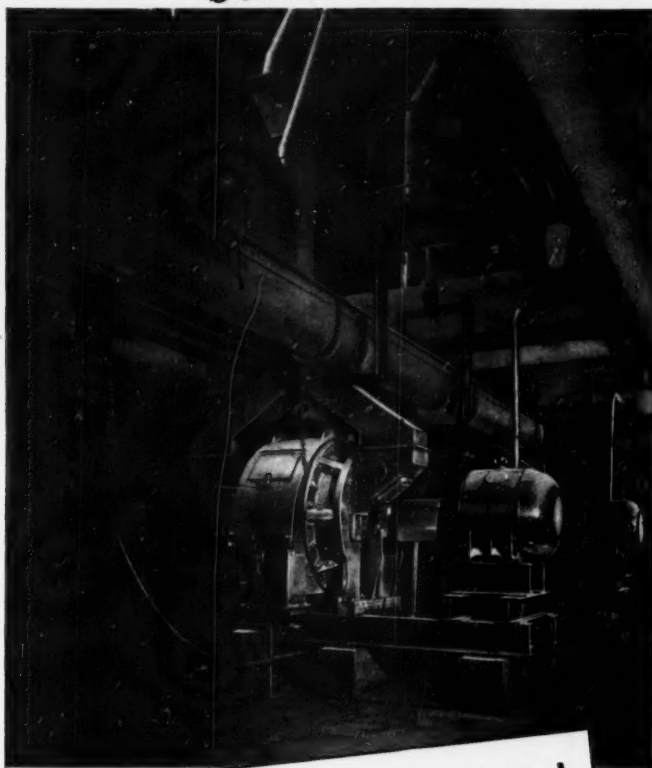
## NEW INSECTICIDE

A revolutionary type of insecticide treatment to protect insect infestation in grains in storage is announced by U. S. Industrial Chemicals, Inc., Chicago, Ill.

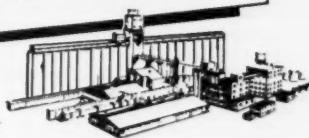
The insecticides are Pyrenone Wheat Protectant for wheat and Pyrenone Grain Protectant for corn and other grains.

Both are safe for use directly on grain for protection against insects. A single application gives full season protection. They will be available in limited quantities this year, but production in 1951 will be stepped up to meet anticipated demands, according to the company.

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## The INOCULANT in the CARTON

SOYBEAN DIGEST





This field is growing a good crop of soybeans this year. But it was also growing soybeans in 1910, 40 years ago! Field is on the Soyland Farm of Taylor Fouts, Camden, Ind. First meeting of the American Soybean Association was held at Soyland in 1920.

## LIFE MEMBERS

(Continued from page 18)

33 million bushels, his agency was engaged by the National Soybean Processors Association to correct certain adverse publicity. Soon he became president of that expanding trade group, and continued in office until 1945 when he resigned to live in Washington. He has retained a connection with the soy flour industry as director of the Soya Food Research Council. He is confident that edible soy protein will eventually equal in importance any other soy product.

From the first with the Processor group he worked in closest harmony with representatives of the growers and his interest in the American Soybean Association has never lagged. He helped in the launching of the Soybean Digest and thereafter actively promoted its interests.

In the war he took the leadership in developing the soybean processing contract and carried this project forward harmoniously, despite major obstacles, and in so doing won the praise and respect of processors and government officials alike.

Mr. Dies is author of eight books, one of them on soybeans—"Gold from the Soil." He is a Fellow of the Royal Economic Society, London; a member of the board of governors of the National Farm Chemurgic Council; Authors League, New York; American Academy of Political and Social Science; American Society of International Law; Union League Club, Chicago; and National Press Club, Washington; and a vestryman of historic St. John's Episcopal Church of Georgetown. Recently he served on the study group for Congress which reviewed the entire federal agricultural research program.

— s b d —

## MEMORIAL FOR BANKS

A number of people have said that they would like to make a memorial tribute to G. H. Banks, late of Wardell, Mo., who died in Los Angeles, Calif., Aug. 10.

It has been suggested that any donations to be made for this cause might be sent to the Masonic Lodge

at Wardell, Mo. This plan has been approved by Mrs. Banks.

"Since Mr. Banks was one of the leaders in organizing the Masonic Lodge of Wardell, it would be greatly appreciated by all of the members," states O. H. Acom of Wardell. I think it would be worthy of any contribution that anyone would care to make."

If you care to be included in the memorial to Heartsill Banks, write Ira Rubottom, secretary-treasurer of the Masonic Lodge, Wardell, Mo. Mrs. Banks will be informed concerning all contributions.

An account of Bank's passing is carried on page 18 of this issue in connection with his election as an honorary life member.

— s b d —

## REJOINS SEEDBURO



CARL O. WALTER

Seedburo Equipment Co., Chicago, announces that Carl O. Walter, Quincy, Ill., rejoined the firm recently after a year's absence. Walter is now representing Seedburo in western Illinois and eastern Iowa.

In the interim Walter was employed by the Moorman Manufacturing Co. and its subsidiary, Pay-U Laboratories. Walter's experience in the grain, feed and seed business totals 7 years, and he is well qualified to counsel Seedburo customers on moisture testing, processing, handling and related problems.

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## MILNER

(Continued from page 29)

(5) effect on internal and external loaf characteristics, such as color and structure; (6) effect on loaf volume; and (7) effect on texture or softness of the loaf interior. In addition, the bread has been distributed for consumer evaluation on a "blind" basis.

Although our results indicate a non-uniformity of production within any given organization, results obtained with some soy flours are definitely encouraging.

The better full-fat soy flours when added at a 6-percent level, based upon the amount of wheat flour, yielded doughs which had excellent handling characteristics and produced loaves of bread equal or superior to the controls in respect to loaf volume, appearance of the exterior and interior, and softness. In fact, except for the color of the interior, the resulting bread was very similar to bread made with added non-fat dry milk solids.

Contrary to the opinions expressed by many commercial bakers, information obtained on the 1,600 loaves of bread distributed for consumer reaction indicates that there is no objectionable flavor from the added soy flour. In fact, a large percentage of the returns indicate a desire for more flavor.

Our survey is to be continued with a coverage of synthetic high-fat and extracted flours similar to that obtained on the full-fat flours. We are also attempting to

determine what fractions of soy flour are deleterious. Already exploratory work on the effects of soy flour fractions indicates that several factors rather than one must be evaluated, thus increasing the difficulty of discovering corrective measures leading to expanded soy flour use.

In the beginning I mentioned the advantages of mutual understanding of the many problems of soybean production, marketing, processing, and research, and that this convention was contributing greatly to that end. Problems often arise between conventions, however, and some of them are best handled through more time for deliberation and consultation than we have here. Whenever you feel that any of us at the Northern Laboratory may be of help, I ask that you remember that my invitation to visit us is not merely of the moment, but a stand-by offer good at any time.

— s b d —

## ARNOLD

(Continued from page 27)

ties of 10 and 20 percent solutions of a water extract from which the oil had been extracted by ethyl alcohol in a Soxhlet extractor were determined. Data for both the trichloroethylene- and alcohol-extracted meal are shown in Table 4 and plotted as temperature-viscosity curves in Figure 3. All of these temperature-viscosity curves showed a rather sharp break, curving upward as gelation began which, together

with direct observation of actual gelling behavior, make it possible to determine approximate gelation temperatures. Comparative gelling characteristics of different concentrations of the water extracts are summarized in Table 5.

The water extract from trichloroethylene-extracted meal gelled at slightly lower temperature than that from alcohol-extracted meal. This indicates that trichloroethylene-extracted soybean oil meal can be used for the production of a water extract similar to that produced from alcohol-extracted meal without the preliminary alcohol wash necessary when using hexane extracted meal.

While it is assumed from the gelling characteristics that the extracted material will have the same general application as that produced from either alcohol-extracted or alcohol washed hexane-extracted meal, further work is contemplated to establish the details of the specific applications.

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# The Pioneers of Soybeans IN THE SOUTH



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Yellow Varieties Are Excellent for  
Edible Purposes.

## JACOB HARTZ SEED COMPANY, INC.

Stuttgart, Arkansas

## CONVENTION

(Continued from page 17)

Hearings were held before the war, at which time your Association took an active part. The war years brought new developments in chemistry, necessitating additional hearings. Proposed standards were issued recently, and of major interest to soybean producers and handlers are two items. On last year's program at Minneapolis Oscar Skovholt told you about synthetic emulsifiers. There was a threat they might replace 500 to 600 million pounds of shortening per year in the bakery industry. The new proposed standards do not permit their use. If this ban becomes effective, it means a continued shortening market, and thus a continued soybean oil market, for that quantity. These standards, then, are highly important to our markets.

The other item is the allowance of up to 3 percent soy flour in white bread. Proposed before the war, this allowance has finally been made in the proposed standards. A more nutritious loaf, more healthful, higher in protein, with no change in characteristics, is possible. The soybean industry's next job is to sell its product to the bakers of America in the full allowable quantity if the proposed standards are published.

Establishment of a comparable export rate on soybeans originating along the Cotton Belt Railroad in Missouri, Arkansas and Louisiana last fall can be attributed to the efforts of the American Soybean Association. Direct contact with the Interstate Commerce Commission as the export movement began was responsible for this move on the part of the Cotton Belt Railroad. Now, of course, all four railroads serving that territory are cancelling the export rate, have announced tariffs considerably higher. Your Association has taken an active part in this fight, with your secretary appearing before both traffic committee and the executive committee of the Southwestern Freight Bureau at their public hearings. Now we have appealed to Interstate Commerce Commission for a public hearing and suspension of the rate in the meantime. Unless suspension is granted, the new rates go into effect on Sept. 15, timed to come just as the new soybean crop

movement begins. The railroads have tried to pull a fast one on us in this rate increase, but there is still possibility of ICC action.

At this time last year your secretary was making plans to head for Germany. I will not report on that ECA mission now, for it has been covered in detail in the Soybean Digest, since that time. The report which Jack Carter and I made to the German Foods Ministry has been reviewed, also, but I do want to point out that we came back firmly convinced there is a continuing market for 100 million bushels of soybeans per year in the European countries, so long as they stay on a favorable price basis, and assuming that monetary exchange can be in some way arranged.

Exports of soybeans and soybean oil have been of major importance during the past year—until such time as our prices climbed so high that we priced ourselves out of the export market. Purchases are again under way full scale out of 1950 crop. During the 1949 year we exported over 23 million bushels of whole soybeans, and we exported the oil from over 40 million bushels, making a total export of soybean oil equivalent of about 65 million bushels, or one third of the marketed crop. The market is there—we can supply it if we will do so—and if we will supply a good quality product. Altogether too much foreign material, trash, other grains, split beans and spoiled beans have gone into this export market. One of the major problems facing the industry is that of cleaning up these export soybeans so they will meet the market demands. If we do not, then someone else is going to supply that market. The soybean industry is going through the same stage on this problem that wheat and cotton have gone through in years past. The problem can be solved—but it must be met head-on and not evaded any longer.

The Association, financially, has had a satisfactory year. We have taken in about \$600 more than we have spent. The Soybean Digest and the Soybean Blue Book have continued to show small profits. The field service program has a little more than paid its way. The general activities of the Association, such as legislative and promotional activities, have utilized the funds available from the other sources,

so that the over-all Association financial report is satisfactory.

However, members of our staff are spending altogether too much time trying to arrange for financing, not enough doing the educational promotional and legislative work. It would seem that an industry which has reached 300-million-bushel proportions should be important enough to merit a well-financed, forward-looking, aggressive industry organization. Perhaps we have not hit on the right combination, perhaps your staff is on the wrong track, or perhaps the need has not yet made itself apparent.

A quick look at successful trade or industry organizations tells us that most of them have been established when an industry had its back to the wall. Maybe the soybean industry is going to have to get in that position before the grower and the handler of the crop recognize the need for united effort.

One bright spot during the past year has been the cooperation of 20 of the smaller soybean processing plants with the American Soybean Association. They have been contributing to a fund to be used for educational and promotional work because they have become convinced of the need for sales campaigns on the products of the soybean. It is hoped that before too long the entire industry can present united front in such a promotional effort. Then we will begin to go places.

Favorable prices on 1950-crop soybeans now appear probable—but it is entirely within the realm of possibilities that we may have a market glut during the harvest season, and if we do we may see some mighty cheap soybeans sold. Oil and meal futures prices would indicate that there should be a rather stable price structure through the year, however.

Soybeans have acquired a bad name in governmental circles. It is not through anything which you and I have done, but through the speculative activities which took place on the Board of Trade. It is sufficient to point out that in the month following the start of the Korean fighting about 267 million bushels of soybeans were traded on the Board of Trade in Chicago. The 1949 crop was 222 million bushels. On July 1 there were in existence about 45 million bushels. The mar-

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and the list continues to grow year after year. There must be a reason.

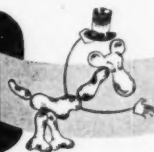
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Goodrich Bros., Winchester, Ind.  
Haynes Soy Products, Portland, Ind.  
Cargill, Inc., Washington, Iowa  
Farmers Grain Dealers, Des Moines, Iowa  
Swift & Co., Des Moines, Iowa  
Kelly Grain Co., Deerfield, Kansas  
Hi-Plains Co-op., Colby, Kansas  
Port of New Orleans, New Orleans, La.  
Harris Milling Co., Mt. Pleasant, Mich.  
Minor Walton Bean Co., Charlotte, Mich.  
Holland Coop., Holland, Mich.  
General Mills, Minneapolis, Minn.  
International Milling Co., Minneapolis Minn.  
Roundup Elevator Co., Roundup, Montana  
Wagner Mills, Schuyler, Nebr.  
Nebraska Consolidated Mills, Omaha, Nebr.  
Farmers Coop. Assn. of N. J., Trenton, N. J.  
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Delphos Grain, Delphos, Ohio  
Norris Grain, Toledo, Ohio  
L. Eaton Wholesale, Guthrie, Okla.  
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River Brand Rice Mills  
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ket became purely a speculative one, and in so doing it became useless for legitimate operators who have used it as a means of hedging. We are to hear from a representative of that market on this program tomorrow. We hope the Board of Trade and the industry will take such steps as will make unnecessary the governmental controls which are being talked.

Current federal grades on soybeans need revision. Changed a year ago, they do not, in my estimation, reflect values. They penalize the careful producer, subsidize the careless one. They should be made to reward the man who brings to the market mature, sound, clean soybeans. Now they reward the man who can come closest to 3 percent foreign material. That must be changed. Export shipments have reflected our lack of adequate grades and grading. We should ask for public hearings and for revision of standards to tighten allowable percentages, rather than loosen them as was done a year ago.

In closing this report, I would like to repeat what I said a year ago. In my estimation the major function of the American Soybean Association should be that of doing everything in its power to place and maintain soybeans in a favorable price relationship with other crops. By so doing, soybean acreage will be maintained, processing mills will continue to operate, local bean buyers and elevator operators will handle large quantities of the crop on a profitable basis, and the true values of the meal and the oil, contained in the crop will be made available to the peoples of the world to whom nutrition is and will continue to be a major problem.

That involves education, legislation, research and promotion, adequately financed and intelligently directed. Therein lies the justification for the existence of an organization such as ours.—GEO. M. STRAYER, SECRETARY-TREASURER.

## Resolutions

### I

Whereas the present grades of soybeans have been in effect for 1 year and have proven a handicap to the efficient producer,

And whereas it is the conviction of the soybean grower that lower standards for grading will always result in less return to the grower from the soybean crop,

Therefore the American Soybean Association goes on record as recommending a change in the grades of soybeans with No. 1 grade to call for 1 percent foreign material and 12 percent moisture; No. 2 grade to call for 2 percent foreign material and 13 percent moisture; No. 3 grade to call for 3 percent foreign material and 15 percent moisture; and No. 4 grade to call for 5 percent foreign material and 17 percent moisture.

And that a copy of this resolution be sent immediately to the grain branch of USDA requesting immediate announcement of public hearings to effect such revision of grade.

### II

Whereas, a record soybean crop has

been produced this year, a crop larger than domestic needs, and

Whereas, a large volume of soy flour was used in the foreign feeding program under Lend-Lease, UNRRA, and the Army in the war and postwar years when production and processing capacity were much smaller than that existing today, and

Whereas, since the creation of ECA no soy flour has been included in the program, with the exception of one minor shipment to Greece, despite the fact that it is the lowest-cost protein ingredient, while many millions of dollars have been allocated for other protein products by ECA, and

Whereas, a broader market for the farmer's soybeans doubtless could be created at this time through an aggressive and realistic policy on the part of ECA, therefore, be it

Resolved, that the American Soybean Association, representing the growers of this second largest cash crop of the Midwest, go on record at this annual convention as urging ECA to give early and serious attention to the possibilities of placing soy flour in its proper and important place in the program; and that a copy of this resolution be sent to Dr. D. A. Fitzgerald, director food and agriculture division, ECA, and to others interested in the welfare of the soybean growers.

### III

Whereas, the Secretary of Agriculture is committed to a support program on 1950 soybeans,

And whereas, the greatly increased 1950 crop poses marketing problems never before encountered by the industry,

And whereas, it will be absolutely necessary to supply additional storage at points of origin of soybeans in order that the soybean growers can take advantage of the benefits to be derived from such a program:

Be it therefore resolved that this convention urge the Secretary of Agriculture to announce immediately any contemplated price support program affecting the 1950 soybean crop.

### IV

In view of the current national defense situation and recognizing that soybeans are the practical crop adjusting factor in both our cotton and corn areas, we suggest that soybean farmers continue to forego the benefits of the rigid high governmental support prices extended to the so called "basic commodities."

We believe that it is in the best interests of our national agricultural economy to keep the acreage and production of soybeans in the United States flexible and voluntary.

### V

Whereas, additional storage at points of origin will be necessary for the orderly marketing of the 1950 crop of soybeans,

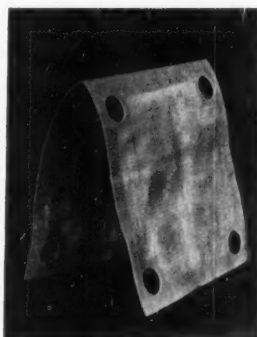
Be it resolved that the Secretary of Agriculture be requested to further farm storage studies to the end that the farmer be encouraged to build adequate farm storage to promote orderly marketing of grain crops.

### VI

In view of the fact that the Food and Drug Administration has now published its findings of fact on the bread hearings that have been in progress since 1941,

And the Food and Drug Administration has decided on the basis of exhaustive evidence that chemical emulsifiers have not been proven to be non-injurious to the consumer's health,

We, the American soybean growers, reaffirm our stand taken in years past that no product shall be incorporated into an American food that has not been conclusively proven to be nutritious and in the interest of the consumer's health.



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## VII

Whereas, soybean oil production this year promises to achieve a new record, thereby bountifully adding to our nation's food supply at a time of national emergency and high food costs, and,

Whereas, millions of our people find a major use of soybean oil in the form of margarine, a nutritious pure food offering proven health values at lower cost, and

Whereas, the Congress has acted in the interest of farm producers, consumers, and the public generally by repealing federal taxes and restrictions on margarine, but 15 states still retain their discriminatory and obsolete laws prohibiting yellow margarine, thereby perpetuating an injustice

to soybean producers and increasing food costs to consumers,

Therefore, be it resolved, that we, the American Soybean Association in convention assembled, hereby do express our sincere acknowledgement and appreciation to the Congress for removing restrictions on margarine, both on behalf of our farmers and the people generally, and,

Be it further resolved, that we earnestly urge the citizens, the soybean growers and the soybean industry, of the states of Connecticut, Delaware, Illinois, Iowa, Michigan, Minnesota, Montana, New York, Oregon, Pennsylvania, South Dakota, Vermont, Washington, Wisconsin and Wyoming, in the interest of fair competition and cheaper nutritious food, to remove

their remaining restrictions on margarine, thereby bringing to themselves full advantage of federal repeal.

And be it resolved that the secretary of this Association make copies of this resolution immediately available to the Secretary of the U. S. Senate and the Clerk of the U. S. House of Representatives, and the legislatures of the states above named.

## VIII

Whereas, it is to the advantage of the soybean industry to eliminate the violent fluctuations in the soybean futures market under the supervision of the Chicago Board of Trade, thereby this convention goes on record as requesting prompt consideration of the multiple delivery of soybeans against the futures trading on the Chicago Board of Trade, and further that a copy of this resolution be sent to the Board of Trade in Chicago.

## IX

Whereas, the soybean industry has recently lost a sterling friend and man who contributed much to the development of the soybean, and

Whereas this man earned and retained the love of all who knew him far and beyond the attainment of the average man by reason of his kindly heart and infectious optimism, together with his unequalled humor, therefore be it resolved that this meeting go on record as expressing its deep sorrow in the recent death of George Heartsill Banks, and that this resolution be placed in the record and copies forwarded to Mrs. Banks.

## X

The Association expresses its sincere appreciation to its hosts, the Leland Hotel; the Springfield Chamber of Commerce and its convention and visitors bureau; Mr. Devany and his staff at the Illinois State Armory; its thanks for our warm welcome from the officials of the state of Illinois, particularly Governor Adlai Stevenson and Director of Agriculture Roy Yung; our appreciation of the generous hospitality of Pillsbury, Inc.; our appreciation to Dr. W. L. Burlison and members of the staff of the department of agronomy of the University of Illinois; our thanks to LeRoy Pike, Carl Simcox, Henry Cohn and others serving on the convention committee for the splendid arrangements for the convention; special appreciation to our president, John W. Evans, and secretary, Geo. M. Strayer, who have given so freely of their efforts to greatly increase the prestige and influence of the American Soybean Association during the past year, to the other officers, directors, committees, and staff of the American Soybean Association, to the entire soybean and allied industries, to the speakers of the convention, and to all others who have contributed to the success of this convention.

## XI

Be it resolved that the foregoing statements be the sentiment of the membership meeting of the American Soybean Association and that copies of these resolutions be supplied to all parties mentioned therein.

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## WOULD RULE OUT BREAD SOFTENERS

Standards of identity for bread, as proposed by the food and drug administration of the Federal Security Agency Aug. 7 contain two findings of direct interest to the soybean industry. They are:

1—Use of bread softeners or emulsifiers—also known as shortening extenders—will not be permitted in bread.

2—White bread could contain soy flour up to 3 percent of the weight of the flour used.

Both findings approximate those advocated by spokesmen for the American Soybean Association and others in the soybean industry.

The announcement of the proposed findings and standards for breads followed lengthy hearings by the agency in 1941, 1943, 1948, and 1949. Interested people were given 30 days to file exceptions to the findings.

The last hearing was prolonged by controversies over the use of emulsifiers, which are petroleum products. The American Soybean Association early recognized the threat of these products to the vege-

table oil markets, since their use would cut down on the use of vegetable shortenings in bread. The Association did not go on record as opposed to their use, however, until medical evidence was developed several months ago that would indicate bread emulsifiers are harmful nutritionally.

The Association favored the optional use of soy flour as an ingredient in bread up to 3 percent rather than the  $\frac{1}{2}$  of 1 percent proposed in the original findings issued by the food and drug administration in 1943. These findings did not become final at that time due to war conditions.

Association officials and members of the legislative committee attended numerous hearings on the proposed bread standards in Washington, D. C., and advocated findings about as adopted.

— s b a —

### WILL HOLD SOYBEAN FESTIVAL IN SEPT.

The third annual National Soybean Festival and Exposition at Port-

ageville, Mo., Sept. 27-30, will be the biggest one yet, according to the Portageville Jaycees who are sponsoring the event.

The Jaycees have adopted as their slogan this year, "Southeast Missouri's Grand Party," and will try to make their 1950 festival live up to its name with carnivals, exhibits, parades and beauty pageants in the gala celebration.



Carolyn Carew, Sikeston, Mo., was the 1949 festival queen.

Climax will be naming of the national soybean queen. Total prizes in all events will

amount to nearly \$2,000 in savings bonds.

All unmarried young women 16 years or older are eligible to compete for the queen title, and the Jaycees say that the Midwest's most beautiful young ladies will take part in the event, to be held Friday evening, Sept. 29. The queen's float parade last year drew more than 5,000 people.

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ATLANTA

GEORGIA



# Crop Maturity Is Delayed Further

Continued cool weather during most of August further delayed maturity of the soybean crop and it was reported behind normal, particularly in northern areas. There were reports of scattered frosts in north Iowa and Minnesota in late August.

Moisture continued to be sufficient in most of the soy belt, though drought was developing in spots the last week of August.

Total yields will be up over most of the soybean growing territory, due to increased acreage. Per acre yield apparently will be below 1949.

Considerable farm and elevator storage has been built this year, but not enough to handle the additional 50 million bushels in prospect Aug. 1. Some observers predict a boxcar bottleneck.

A record soybean crop of 270.7 million bushels is forecast from conditions on Aug. 1 according to U. S. Department of Agriculture's crop reporting board. This is 48.4 million bushels above the production last year and 47.7 million bushels higher than the previous record crop produced in 1948. This bumper crop is due almost entirely to increased plantings since the indicated yield of 20.9 bushels per acre is 1.5 bushels below the 1949 record yield. The 10-year average yield is 18.8 bushels per acre.

Reports of Soybean Digest crop reporters follow:

## Alabama

J. H. Bryson, Jr., Dothan Oil Mill Co., Dothan, Ala., for northwest Florida, southeast Alabama, southwest Georgia (Aug. 21): Maturity normal. Ogden and Clemson blooming well. Ogden setting crop. Showers needed to make crop set. Yield outlook 17 to 25 bu. Total prospective

yield about same as 1949. Weed control excellent.

H. I. West, Bay Minette, for Gulf Coast (Aug. 20): Our beans mature October and November. Look for some very high yields. Dry weather affecting only late planted beans. Yield depends on weather. Total yield looks 15% over 1949. Army worms due last of August. Should be under control. Enough airplanes to take care of job. Storage facilities look ample.

## Arkansas

L. M. Humphrey, R. L. Dortch Seed Farms, Scott, for Little Rock area (Aug. 19): Maturity normal. Plenty of moisture and temperatures very favorable for podding. Yield outlook at least as good as 1949, maybe better. 20-30% total yield increase due to increased acreage. Weed control reasonably good considering excessive rainfall all summer. There will not be enough storage or transportation. Situation may become quite serious.

Keith Bilbrey, county agent, Blytheville, for north Mississippi County (Aug. 19): Maturity maybe a week late. Cool summer and very wet all year. Average yield same or maybe 1 bu. better than 1949. Prospect for over 3 million bu. for Mississippi County in 1950. Weed control little better than usual because labor more plentiful and eager to work. Least bean leaf beetle damage in years. No disease. Farmers can store between 400,000 and 500,000 bu.—a considerable improvement over last year. With favorable weather our crop will come out of fields quickest in history. Farmers already bought over 120 big self propelled combines, not to mention other types. Quick harvest will complicate our marketing and shipments out of area.

Jacob Hartz Seed Co., Inc., for south central and southeast (Aug. 21): Maturity normal. Good moisture. Yield outlook equal or better than 1949. Total prospective yield 45% greater. Weed control very good. Our beans are clean this year. Bacterial blight showing up in some varieties. Several fields infested very heavy south end of Arkansas County. Not

enough storage to handle crop. However, conditions somewhat better than last year as some new storage being built and rice crop not as large. Expect shortage of box cars at harvest time.

## Illinois

C. G. Simcox, Assumption, for Christian and Shelby Counties (Aug. 20): Maturity normal. Weather and moisture conditions excellent. Yield outlook as good as 1949. More weeds than usual. This town will handle over 300,000 bu. at harvest time. We have enough storage if we can get a few cars.

Russell S. Davis, Clayton, for west central (Aug. 21): Maturity well advanced. Very few late fields. Abundant moisture. Nights a bit cool for rapid progress. Better yield prospect than at this date a year ago. Weed control better than average. Volunteer corn worst weed hazard. Still looks like bumper crop in this section. Light wheat crop left more than average local storage.

Gilbert F. Smith, Mahomet, for east central (Aug. 19): Crop maturity normal. August dry, but plenty moisture before, enough to carry crops for awhile. Average and total yield look about same as 1949, from the growth. Boxcars at present are short but we are in trucking distance of Champaign, Gibson City and Decatur so do not look for much trouble.

J. E. Johnson, Champaign, for Champaign and adjoining counties (Aug. 20): Maturity 1 week behind. Cool temperatures have prevailed throughout growing season. Foliage very heavy. Bean development slow. Rainfall heavy all season. Will need some hot dry weather in September to make for best yield. Yield outlook at present comparable to 1949. Continued rains have stimulated heavy weed growth. Believe this will become factor in both yield and maturity. Signs of stem rot, more mosaic than usual. Anticipate more disease loss than in 1949.

Walter W. McLaughlin, Decatur, for Decatur (Aug. 21): Maturity normal. Plenty of moisture. Weather cool but apparently beans maturing nicely. Average



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yield outlook about same as 1949, total 10% greater. More weeds than normal. Some blight showing up but not serious yet.

*Robert W. Weitzer, Valley Farms, Carrollton, for west central (Aug. 22):* Earlier varieties will be 7-10 days late due to recent moisture. Weather very cool. Yield should equal or excel 1949. Weed control not too good. Many fields cleaned out by hand only to have weeds come through again. Weedier fields will be defoliated. Makes for easier and cleaner job of combining. Not enough storage or transportation by rail. Lot of beans will move by truck.

*Floyd Wilken, Pike Hybrid Corn Co., Pontiac, for east central (Aug. 21):* Maturity behind normal. Weather dry and cooler than normal. No general rain for over 3 weeks. Average and total yield outlook lower than 1949.

## Indiana

*Chester B. Biddle, Remington, for northwestern (Aug. 20):* Moisture very satisfactory. Temperature rather low. Average yield equal to or above 1949. Total 10% up. Weed control successful except under unusual conditions due to excessive moisture. Farm storage inadequate. Transportation facilities seem adequate.

*George K. Black, J. A. McCarty Seed Co., Evansville, for southwestern (Aug. 19):* Maturity average to 10 days late. Plenty of moisture. Average yields should exceed 1949 by 3 to 5 bu. Total yield increase of 15 to 20%. Weed control not too good. Not enough days dry enough to cultivate all corn and beans. Some manganese deficiency showing up. Grasshoppers getting chlordane and toxaphene. One local grower reports that according to the katydids we should have our first frost in mid-October.

*S. D. Hollett, Swift & Co., Frankfort,*

State	Yield per acre			Production		
	Average			Average		
	1938-48	1949	Indicated 1950	1938-48	1949	Indicated 1950
	Bushels			Thousand bushels		
Ohio	19.3	24.0	22.0	17,547	20,592	23,564
Ind.	18.4	23.0	21.0	22,958	33,166	35,280
Ill.	21.2	26.0	24.0	64,513	82,602	92,760
Mich.	16.4	22.0	20.0	1,525	1,452	2,180
Wis.	14.2	16.5	14.5	490	248	290
Minn.	15.4	17.5	17.0	5,995	12,408	18,054
Iowa	19.6	22.5	21.0	28,766	28,778	38,178
Mo.	15.0	21.0	21.0	8,046	17,997	23,856
Kans.	11.1	14.5	14.0	1,715	3,436	4,368
Va.	14.8	18.0	16.5	1,128	2,106	2,244
N. C.	12.0	15.0	14.5	2,675	3,960	4,147
Ky.	15.2	18.5	17.5	1,102	2,202	2,292
Tenn.	13.5	19.0	19.0	642	1,140	1,710
Miss.	12.8	15.5	18.0	1,212	1,674	5,274
Ark.	14.6	20.0	19.5	2,980	5,820	9,750
Other States	12.8	15.1	15.9	3,198	4,724	6,954
United States	18.8	22.4	20.9	164,491	222,305	270,701

Aug. 1 report of U. S. Department of Agriculture crop reporting board.

*for central (Aug. 21):* Maturity normal. Moisture good. Present weather too cool for best maturing of crop. Average yield 1 to 3 bu. lower than 1949. Total yields up 10 to 15%. Movement of crop will be big problem.

*Ersel Walley, Walley Agricultural Service, Fort Wayne, for northeast Indiana and northwest Ohio (Aug. 21):* Maturity average or earlier. Need rain in some localities. Average yield maybe slightly lower than 1949. Total prospective yield 110% of 1949. Early beans are rank but doubtful if they are as well podded as last year. Most growers who want to store can do so. Local elevators may have some temporary jams.

*K. E. Beeson, extension agronomist,*

*Purdue University, Lafayette (Aug. 21):* Maturity of crop at least normal. Weather and moisture almost ideal. Weeds have grown vigorously and probably are more abundant than usual. What was formerly identified as pod and stem blight but now considered to be to some extent a canker disease being reported rather frequently in central; usual leaf troubles have appeared in southwest; and frog-eye on Gibson variety, the acreage of which has been greatly reduced this year; and some nutritional deficiencies especially of manganese and potash have shown on limited areas on northwest.

*Peter J. Lux, State PMA, Indianapolis (Aug. 23):* Maturity a little early. Weather and moisture conditions good. Per acre yield outlook 5% higher than 1949. Grand prospective total yield, 8% would be caught by frost at normal date.

## Iowa

*O. N. La Follette, State Department of Agriculture, Des Moines (Aug. 18):* Maturity about 15 days late for state as a whole. Moisture mostly adequate but a few dry spots. Generally cool. Yield outlook near average, but deficient in some areas. Total bushels above 1949. A lot of corn growing in some fields. Above average wheat and oat crop requiring storage and transportation makes outlook doubtful for soybean movement.

*John Sand, Marcus, for northwest (Aug. 18):* Maturity week later than normal. Weather continues cool after unusual month of July. Average yield larger than 1949. Total yield outlook if beans mature with increased acreage should be 25% higher. Most fields exceptionally clean. Anticipate shortage of storage room.

*Leslie M. Carl, U. S. Department of Agriculture, Des Moines (Aug. 21):* Maturity about 10 days late. Temperature was too cool in early blooming stage and warm rains needed. Average yield out-

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look from 1 to 2½ bu. less than 1949. 10% would be caught by frost at normal date.

Otis J. Luttschweager, Buckeye, for north central (Aug. 18): Maturity of crop average. Moisture below normal. Weather cool. Larger total acreage but per acre yield same as 1949. Outlook for movement of crop questionable.

Fred Hawthorn, Castana, for western (Aug. 22): Maturity week late. Ample moisture. Cool weather. About same average yield on larger acreage than 1949. Some late beans planted on flood ground would be caught by frost at normal date. Think a larger share of 1950 crop will be sold from combine if prices favorable.

## Kansas

E. A. Cleavinger, extension division Kansas State College, Manhattan, for eastern (Aug. 19): Maturity slightly late. Weather and moisture conditions excellent. Estimated 20% increase in yield per acre. With less acreage than 1949 will hold down production about same.

G. C. Wareham, Thomson Soya Mill, Hiawatha, for northeast (Aug. 19): Maturity of crop fair. Some fields just starting to bloom. High rainfall for August. Unusually cool. Total yield prospect 50% over last year due to increase in acreage. Weed control not too good due to excessive rainfall.

Kansas Weekly Crop Report (Aug. 22): Most soybeans have made very heavy vine growth; in a few low wet areas, are losing color.

H. L. Collins, Topeka, (Aug. 23): By week end of Aug. 18 68% were showing pods compared to half the crop in this stage a week earlier. Crop slightly later than last year. Moisture abundant. Some soybeans turning yellow in low wet spots. Cool and wet weather has favored rank growth but delayed pod formation. Little would be caught by frost at normal date. Some late beans weedy where wet fields prevented cultivation.

## Louisiana

W. M. Scott, Tallulah, for northeast (Aug. 20): Maturity 1 week to 10 days early. Sufficient moisture. Weather good. Yield outlook 8 to 10% above 1949 due to better cultivation and care. Expect yields of 20 to 20½ bu. Outlook doubtful for movement of crop.

## Minnesota

John W. Evans, Montevideo, for southwest central (Aug. 20): Maturity 90%. Weather and moisture conditions generally good. Some spots needing moisture. Temperatures below normal. Official weather report 39 degrees Saturday night, Aug. 19, but numerous reports of frost damage in both corn and late planted soybean fields. Outlook for average yield 100% of 1949, total yield 120% of 1949. Believe a few more beans will be kept on farm.

Howard E. Grow, Farmer Seed & Nursery Co., Faribault, for south central (Aug. 23): Maturity of crop 1 to 2 weeks late. Weather cool. Frost already damaged some fields on low land. Outlook for average yield equal to 1949 if weather permits normal maturity. Increase of 25% in total yield. 40-50% would be damaged by Sept. 15 frost. Probably sufficient storage.

R. E. Hodgson, Waseca, for south central (Aug. 18): Estimate maturity 7 days late. Weather cool. Plenty of moisture. Average yield outlook at least equal to, possibly better than 1949 unless we have early frost. Total prospective yield up 20%. Frost Sept. 20 would catch 50%. I think beans can be handled in this locality.

## Missouri

E. M. Poirot, Golden City, for southwest (Aug. 19): Maturity of crop normal. Weather and moisture conditions excellent. Outlook for average yield higher than 1949, total yield 5% more.

J. Ross Fleetwood, extension specialist in field crops, Columbia (Aug. 23): Maturity normal. Abundant moisture but cool weather. Total prospective yield 30% above 1949. Very few would be caught by frost at normal date. Weed control usually very good. Probably no serious problems in movement of 1950 crop.

Harry A. Plattner, Malta Bend, for central (Aug. 19): Maturity 90% normal. Weather and moisture conditions good.



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Total prospective yield larger than 1949 due to acreage increase. Weed control good where hand hoe was used. Prospects for handling of 1950 crop good.

### New Jersey

John E. Baylor, assistant extension specialist in farm crops, New Brunswick (Aug. 21): Maturity nearly normal in general. Some fields quite late. Moisture adequate most areas. Average temperature slightly below normal retarding growth. Average yield should be as good or better than 1949 with good weather. Acreage up from 26,000 to 30,000. Scattered Japanese beetles.

### North Carolina

State Weekly Crop Report (Aug. 15): Over 60% of all reports show crop in good condition. Other 40% evenly divided between fair and very good. All but one of "very good" reports came from heavy commercial areas of coastal plains.

Charles F. Latham, H. V. Latham Seed Co., Belhaven, for Beaufort County (Aug. 21): Maturity 80%. Crop late. Very wet in some sections. Yield prospect 75% of 1949. 15% would be caught by frost at normal date. Storage limited. Practically none on farm. Big storage at Wilson will help. Transportation adequate, both truck and rail. Heavy rains (14 in. in 2 days) during the first week in July severely damaged young beans and hurt old beans. However, crop has improved some last 3 weeks. Some beans will come in first week in October, but bulk will be harvested in late Oc-

tober and November. An early frost could cut yield materially.

### North Dakota

C. J. Heltemes, Fargo (Aug. 23): Maturity 2 to 3 weeks late. Weather too cool. Dry in most of soybean area. Light frost in spots Aug. 18 to 20, but not much damage. Per acre yield outlook as good or better than 1949 if crop matures. It's still in bloom. Production will be larger because acreage doubled. Most of crop at least a month to maturity.

W. P. Sebens, Fargo (Aug. 20): Maturity 2-3 weeks late. Most of crop was put in late and temperature has been below normal most of time. Most of soybeans are in Red River valley where dry, cool weather has somewhat retarded growth. Yield will depend largely on weather next 4 or 5 weeks. About 50% would be caught by frost at normal date. Storage should be ample. At present serious shortage of boxcars.

### Ohio

G. G. Mellroy, Farm Management, Inc., Irwin, for west central (Aug. 19): Weather conditions spotted. On average crop has deteriorated 10-15% during last 2 weeks on account of dry weather. Total prospective yield 10-20% above 1949. Beans are cleaner than average. Some fields of Hawkeye show 40-45 inches in height.

Soybean Johnson, Delphos Grain & Soy Products Co., Delphos: Have just completed 530 miles through 12 western Ohio and 12 eastern Indiana counties, all north of U. S. Route 40 and running to Michigan line.

Section No. 1, north of line through Columbia City, Decatur, Ind., and Celina, Ohio: too much rain, and too cold all season. Foliage looks like 40 bu. to acre. Even rowed fields show very poor podding, 18 to 20 bu. per acre. Solid fields much worse. Many with almost no pods at all. Section No. 2, a belt running 25 miles wide immediately south of the first section: Has not had as much rain, but enough and cold all season. Fields look better than Section 1, but solid fields in Ohio look like 18 to 20 bu. per acre, rowed fields a little better. Section No. 3, running through Anderson, Muncie, Richmond and east through Ohio but north of Route No. 40: Last 3 weeks has been dry with some pods and leaves sluffed off, but well podded higher. Most all Indiana fields in wide rows. Rain last week will finish crop in good shape. Yields range from 25 bu. to 35 bu. per acre. I have seen 112 fields in the area covered and the government estimate for Ohio can be safely reduced 6 million bu. and for Indiana 3½ million.

### Tennessee

Peter Fredrickson, Tiptonville, for west Tennessee and Fulton County, Kentucky (Aug. 19): Maturity average. Weather and moisture conditions good. Average yield outlook 105% of 1949. Total yield 20% more.

### Virginia

Henry M. Taylor, Department of Agriculture, Richmond (Aug. 21): Maturity 7 days late. Yield outlook 10-15% larger than 1949. Off farm storage has increased since 1949 but still not sufficient. Many growers will have to store on farm.

### Wisconsin

Hilmer B. Schauer, Hartford, for Hartford (Aug. 20): Good growth but 4 weeks late. Ample moisture. Weather too cool. Yield prospects good if frost holds off until Oct. 1. 100% would be caught by frost at normal date. Some yellowing of bottom leaves.

### Canada

R. H. Peck, River Canard, Ontario, Canada, for southwestern Ontario (Aug. 21): Maturity about normal. Moisture somewhat spotty. Main area has just enough to keep crop coming along. Very cool weather past few days slowing pod growth. Average yield possibly 10% below last year's record. Total 15-20% greater with increased acreage. With the possibility of more farm storage this year storage and transportation should not be too bad unless a shortage of railway cars develops.

— s b d —

### FLAX ACREAGE

Canadian flaxseed acreage for 1950, forecast at 511,000 acres, is an increase of 68 percent over the final estimate of 322,000 acres for last season, but a decrease of almost 60 percent from the 1944-48 acreage, according to U. S. Department of Agriculture's Foreign Crops and Markets.

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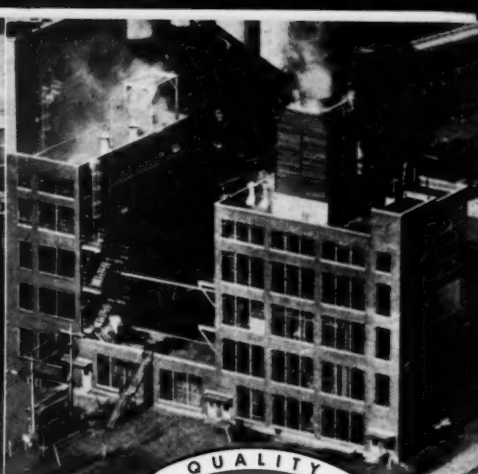
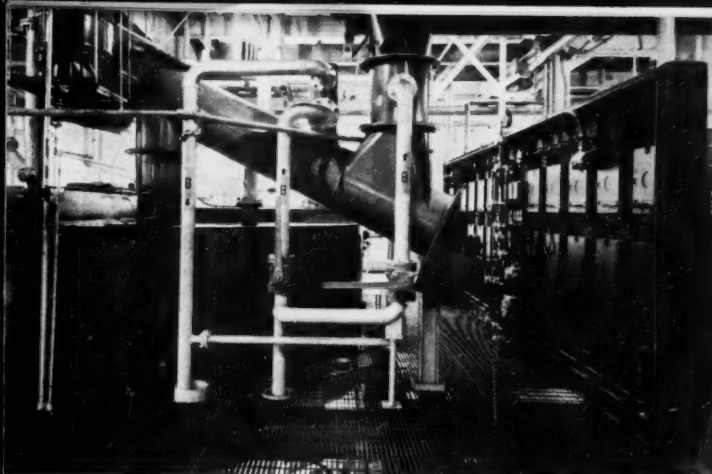
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Residual oil in extracted flakes corrected to 12% moisture	not more than 0.5	0.446		.5
Oil Quality	% Moisture and volatile matter	not more than 0.2	0.15	.13
	Flash point	over 350° F.	over 350° F.	over 350° F.

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# WASHINGTON DIGEST

**BUMPER CROPP** A bean crop of close to 300 million bushels is the expectation of officials here. They privately estimate the seasonal average farm price to be at least as good as last year's.

The seasonal average is expected to run around \$2.20 to \$2.25 a bushel at the farm. For the year ending September 30, 1950, the farm average will be about \$2.15.

The August forecast of 271 million bushels is rated too low. The Crop Estimates Board nearly always has its first estimate too low in a year when a bumper crop is on the way.

The impact of the bumper crop probably will drive prices unusually low this fall. Officials think bean prices may drop to \$2 a bushel at the farm, or even a little lower. The low point last year was \$1.95, the November farm average.

Crushing capacity will be pushed to the limit this fall, officials say. Not until the cottonseed crop is out of the way can much relief be expected. Both cottonseed and flax crushers will handle some beans after taking care of their normal trade. Bear in mind that freight to far-off crushers must be borne by soybean producers.

The largest bean crush on record is 190 million bushels. This year 200 million bushels or more must be processed.

Farmers normally sell 70 percent of their crop by the first of the year. This year it's practically a sure-fire bet to make money by holding back for major sales in 1951.

It's true that sales after Dec. 31 will be subject to the full 20 percent federal income tax increase. Even

so, officials think farmers stand to make handsome profits by storing. The tax situation, however, may have a psychological effect and cause some producers to sell early.

It seems certain that the increase in the bean crop will at least offset the short cottonseed crop. USDA figures it will take a bean crop 60 million bushels larger than the 1949 crop to make the combined cottonseed and bean crops equal last year's total. In other words, a bean crop of 282 million bushels.

**EXPORTS.** The bean and oil export picture doesn't look good for 1950-51. At least, not nearly as good as in the last 2 years. There is one encouraging factor, but it's hard to evaluate. That's the increased dollars foreign countries will get from the stepped-up U. S. buying of international commodities such as rubber, tin and sugar. Just how much will go to beans is impossible to tell.

Army demand for beans will be strong this coming season both for Germany and Japan—but for whole seed rather than oil and meal.

The extent of Army buying here will depend partly on the U.S. price, but also on the volume that can be obtained from Manchuria.

**PRICE SUPPORT.** Commodity Credit Corp. announced Sept. 6 that it would support 1950-crop soybeans at \$2.06, which is 30 percent of Aug. 15 parity, as computed by Bureau of Agricultural Economics.

This is 5 cents lower than the price at which the 1949 crop was supported but 20 cents higher than had been expected before the out-

By PORTER M. HEDGE

Washington Correspondent for  
The Soybean Digest

break of the Korean war.

Grade differentials are set similar to those of last year. Premiums for lower than 14 percent moisture will be announced later.

The cottonseed loan rate was set at \$51 per ton with the purchase price \$3 lower.

Lower prices for soybean and cottonseed meal are expected by USDA when the big bean crop comes along. It's believed meal prices will drop to \$60 a ton in the October-December period before rising after the cottonseed crop is crushed.

In making 1950-51 price projections for soybeans, tentative seasonal average estimates in use here now are 12½¢ a pound for crude oil, and \$65 a ton meal. This is for the entire 1950-51 season.

These figures give an average seasonal price of about \$2.85 a bushel. Figuring freight and processing costs at 65¢, the resultant farm average price is \$2.20 a bushel. Handling and processing margins in 1935-39 averaged 44¢ a bushel, in the marketing year 1947, \$1.10, in 1948, 84¢, and the first nine months of the present marketing year they ranged from 53 to 70¢ with the average about 62¢ a bushel.

**SUPPORTS.** Here's the whole story as to why USDA didn't announce a soybean support earlier. First, bear in mind that loans for beans are not mandatory under the

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law now. It's all up to the Secretary of Agriculture.

Secretary Brannan held off last spring until Congress voted more support funds for CCC. When that materialized late in June, the first step was to set a rate for cottonseed, then make the soybean rate conform. Since the politically powerful South was involved, USDA officials moved cautiously. They held a series of Southern conferences in July. By that time the price of cottonseed had gone to \$75 a ton or more. Officials didn't want to disturb that picture—thought they might be able to avoid supports.

Officials then didn't want to announce a low support price for soybeans lest they be accused of breaking a market that was due to break anyway. So they did nothing.

#### BRANNAN REPORTS ON SOYBEAN SPECULATION

Heavy speculative buying of soybean futures in the period preceding the outbreak of the Korean war was detailed in reports on commodity speculation issued by Secretary of

Agriculture Charles F. Brannan early in August. The reports were based on special investigations of futures accounts made by the Commodity Exchange Authority. Brannan said 47.3 percent of total holdings in the July soybean future on the Chicago Board of Trade was held by Chinese-name accounts as of June 30. Conspicuous among the Chinese accounts were 14 carried by a Hong Kong commission firm under circumstances pointing to common control and possible common ownership. These 14 accounts took de-

livery of more than 2 million bushels of actual soybeans under their July futures contracts.

Commenting on the report, Secretary Brannan said: "For the past 4 months the Chicago soybean futures market has been dominated by speculative trading and has not been serviceable to legitimate hedgers. This is shown by the wide-spread complaints we have received from the trade, as well as by the investigations and market analysis work of the Commodity Exchange Authority.

### Market Street

We invite the readers of THE SOYBEAN DIGEST to use "MARKET STREET" for their classified advertising. If you have processing machinery, laboratory equipment, soybean seed, or other items of interest to the industry, advertise them here.

Rate: 3c per word per issue.  
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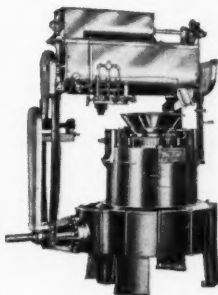
**FOR SALE: ALL TYPES USED OIL** mill equipment, Hydraulic, Screw-Presses, Expellers, Cookers, Toasters, various size Filter presses. If used in Oil mill we have it. V. A. Lessor & Company, P.O. Box No. 108, Phone Market-3352, Fort worth, Texas.

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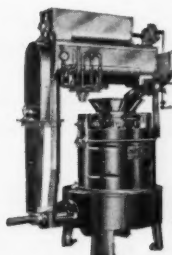
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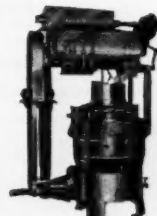
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**JUMBO MODEL** 5.2  
50 h.p.  
Capacity 12,000 to 14,000  
pounds per hour.



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35 h.p.  
Capacity 7,500 to 8,500  
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25 h.p.  
Capacity 5,000 to 6,000  
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- Simple in design and operation.
- Pellet sizes can be varied by changing dies.
- Sturdy and fool-proof—untrained men can operate machine.
- Will handle moisture content low as 1/2 to 2%.
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plant will process 250,000  
bushels a month!

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Bloomington, Illinois.  
This makes six cash mar-  
kets serving you who  
have soybeans to sell.



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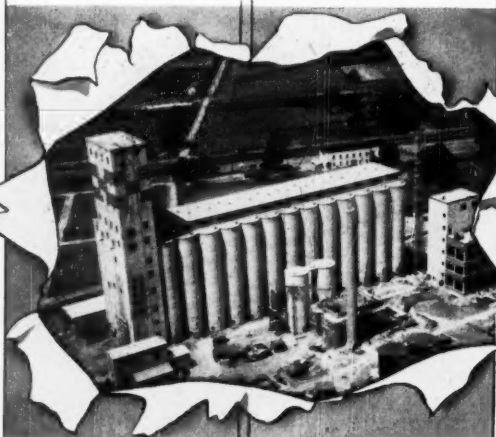
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Buy the Feeds that use the Soybean!



## IN THE MARKETS

### Beans, Meal Lower

Markets for both soybean oil meal and soybean futures lost considerable ground the first half of August. Soybeans regained some of the lost ground during the last 2 weeks of the month, while the meal market leveled off.

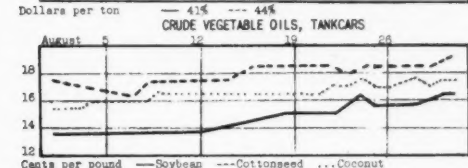
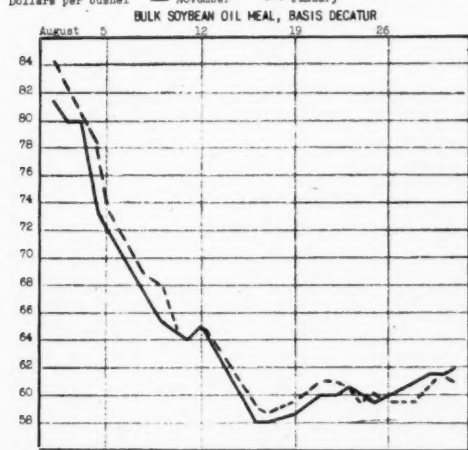
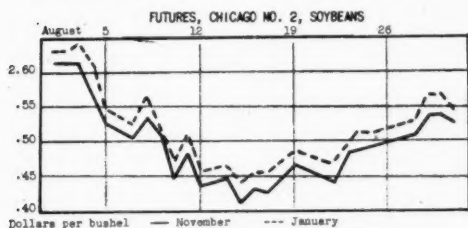
Low point for November beans was \$2.41 Aug. 15—31c below the July high of \$2.72. Bulk 44% soybean oil meal declined to \$58 at the low point compared to a month-earlier high of \$90.

On the contrary, fats and oils were stronger. Soybean oil gained 2½c during August.

Bearish factors in the weak meal and soybean markets the first half of August were chiefly the poor demand for meal and the July 1 report of USDA that indicated a much larger supply of old crop beans than had been expected. The uncertainty of enough space to store the crop also had an effect.

Crushers had a rather large supply of soybeans on hand and there was little incentive to buy on a weak meal market. Buyers were said to have bought ahead after the Korean outbreak and to be well stocked up.

A bullish factor was the small cotton crop forecast



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MANUFACTURERS OF  
Dannen 41% Soybean Oil Meal  
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Soybean Oil Meal, 44 & 41%

Solvent and expeller oil.

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by USDA. Strengthening influences in the bean market the latter part of August were substantial purchases for export, increasing concern over the backwardness of the soybean crop, and Secretary of Agriculture Brannan's statement that there is no need for farm price controls at this time.

It was reported that Italy bought a cargo of soybeans, and that 700,000 bushels were bought for Western Germany. There was also talk of an additional ECA grant for purchase of soybeans.

Soybean oil borrowed strength from cottonseed oil, and from a stronger soybean futures market the latter part of August. The Korean outbreak and partial mobilization helped to create a good turnover of oils.

**MEMPHIS SOYBEAN OIL MEAL FUTURES CLOSINGS AUG. 31\***  
Decatur sacked basis, per ton: Oct., 60.95 @ 61.00; Dec., flat 59.75; Jan., 59.75 @ 60.10; Mar., flat 60.25; May, flat 60.00; July, 60.25 @ 61.00. Sales: 6,800 tons.

**NEW YORK SOYBEAN OIL FUTURES CLOSINGS AUG. 31\***  
Jan., 13.00b; July 12.90b; Aug., 12.90n. Sales: Sept., 6; Oct., 27; Nov., 4; Dec., 17; Mar., 8; May, 22; switches, 4. Total sales: 88 contracts.

**CHICAGO SOYBEAN OIL FUTURES CLOSINGS AUG. 31\***  
Nov., 13.20b; Dec., 13.15b; Jan., 13.00; Mar., 12.95b; May, 12.95. \* Reported by the Chicago Journal of Commerce.

Relatively large stocks of nearly 45.9 million bushels of soybeans were in all storage positions on July 1, according to reports assembled by the Bureau of Agricultural Economics. These stocks compare with 40.3 million bushels a year earlier and are the largest since July 1, 1945. Stocks of 47.8 million bushels on July 1, 1944 were largest for the date in the 9 years of record.

The current total includes about 28.5 million bushels of soybeans at processing plants, as enumerated by the Bureau of the Census, and commercial stocks of 6.2 million bushels at terminals, reported by the Production and Marketing Administration. The Crop Reporting Board estimated farm stocks at 6.8 million bushels and holdings in interior mills, elevators, and warehouses at 4.4 million bushels, both relatively small for July 1. But stocks at terminals and processing plants are each largest of record for July 1.

### STOCKS OF SOYBEANS, JULY 1, 1950, WITH COMPARISONS

Position	July 1, 1948	July 1, 1949	July 1, 1950	July 1, 1950
			Thousand bushels	
*On Farms	4,311	9,505	44,014	6,832
†Terminals	1,244	3,294	10,241	6,190
‡Processing Plants	22,986	18,333	47,991	28,478
*Int. Mills, Elev. & Whses. <sup>1</sup>	3,238	9,134	17,412	4,354
<b>TOTAL</b>	<b>31,779</b>	<b>40,266</b>	<b>119,658</b>	<b>45,854</b>

\* Crop Reporting Board

† Grain Branch, P.M.A.

‡ Bureau of the Census

<sup>1</sup> All off-farm storages not otherwise designated.

### OFF-FARM STOCKS OF SOYBEANS, JULY 1, 1950, WITH COMPARISONS

State	July 1, 1949	Apr. 1, 1950	July 1, 1950	State	July 1, 1949	Apr. 1, 1950	July 1, 1950
			Thousand bushels				Thousand bushels
Ohio	3,540	10,231	5,970	Kans.	327	1,064	511
Ind.	2,034	6,286	2,221	N. C.	117	782	306
Ill.	11,219	29,798	16,311	Ky.	879	1,756	1
Minn.	2,156	2,914	1,441	Ark.	4	1,283	5
Iowa	6,595	11,359	6,782	All other	2,065	6,045	5,577
Mo.	1,825	4,126	1,897	U. S.	30,761	75,644	39,022

<sup>1</sup> Includes stocks at processing plants, as enumerated by the Bureau of the Census; commercial stocks at terminals, reported by the Grain Branch, P.M.A.; and stocks in interior mills, elevators and warehouses, estimated by the Crop Reporting Board.

● **SHORTENING SHIPMENTS.** Reported by the Institute of Shortening and Edible Oils, Inc., in pounds.

Week ending July 29	9,305,836
Week ending August 5	8,090,177
Week ending August 12	7,339,239
Week ending August 19	6,949,907
Week ending August 26	6,458,144

SOYBEAN DIGEST



● **OIL MILL PRODUCTS.** Reported by Bureau of Census, Department of Commerce.

**PRIMARY PRODUCTS EXCEPT CRUDE OIL, AT CRUDE OIL MILL LOCATIONS: PRODUCTION, SHIPMENTS AND TRANSFERS AND STOCKS, JUNE 1950—MAY 1950**

Products	Production		Shipments and transfers		End of month Stocks	
	June 1950	May 1950	June 1950	May 1950	June 30, 1950	May 31, 1950
<b>SOYBEAN:</b>						
Cake and Meal†	223,249	394,162	340,888	397,275	45,965	83,604
Lecithin‡	1,179,042	1,230,241	1,304,454	1,197,367	678,349	803,761
Edible soy flour, full fat†	530	423	467	461	220	157
Edible soy flour, other†	4,835	5,530	5,097	6,797	1,147	1,409
Industrial soy flour	(*)	(*)	(*)	(*)	(*)	(*)

(\*) Not shown to avoid disclosure of individual operation.  
† Unit of measure in tons. ‡ Unit of measure in pounds.

**SOYBEANS: RECEIPTS, CRUSHINGS AND STOCKS AT OIL MILLS, BY STATES, JUNE 1950—MAY 1950 (Tons of 2,000 pounds)**

State	Receipts at mills		Crushed or used		Stocks at mills	
	June 1950	May 1950	June 1950	May 1950	June 30, 1950	May 31, 1950
U. S. ....	229,664	†298,242	417,381	506,403	854,327	†1,042,044
Arkansas ..	(*)	(‡)	6,831	8,922	(*)	13,146
Illinois ..	95,816	126,127	160,771	199,192	362,547	427,502
Indiana ..	16,501	(*)	41,146	43,649	47,245	71,890
Iowa ..	49,895	76,375	80,398	90,146	161,387	191,890
Kansas ..	(*)	(*)	7,896	8,000	(*)	9,383
Kentucky ..	7,029	6,068	14,247	16,460	(*)	(*)
Minnesota ..	12,882	13,169	13,429	20,507	14,283	14,830
Missouri ..	(*)	(*)	12,240	23,292	(*)	44,091
Nebraska ..	(*)	(*)	(*)	(*)	(*)	(*)
North Carolina ..	(*)	(‡)	(*)	5,079	9,036	(*)
Ohio ..	33,398	†34,349	55,698	61,281	152,097	(*)174,397
Oklahoma ..	—	—	—	—	—	—
Texas ..	—	—	—	—	—	—
All Other ..	14,143	44,419	24,725	29,875	107,732	94,915

† Revised. ‡ Included in "All other" to avoid disclosure of individual operations. † Receipts exceeded by reshipments of beans previously received and held in the State. U. S. receipts are on a net basis, excluding transfers between mills.

**SOYBEAN PRODUCTS: PRODUCTION AND STOCKS AT OIL MILL LOCATIONS BY STATES, JUNE 1950—MAY 1950**

State	Crude Oil (thousand pounds)		Cake and meal (tons)	
	June 1950	May 1950	June 1950	May 1950
U. S. ....	141,705	169,001	36,927	36,447
Arkansas ..	1,967	2,630	733	839
Illinois ..	55,998	68,574	10,891	10,523
Indiana ..	14,122	14,770	2,402	2,186
Iowa ..	28,960	30,185	8,624	6,744
Kansas ..	2,855	2,786	1,053	1,158
Kentucky ..	5,250	5,951	612	936
Minnesota ..	4,423	6,692	1,892	2,707
Missouri ..	3,941	6,991	864	1,567
Nebraska ..	(*)	(*)	326	(*)
N. Carolina ..	(*)	1,421	782	652
Ohio ..	18,497	29,156	4,092	4,702
Oklahoma ..	—	—	—	—
Texas ..	—	—	—	—
All other ..	7,692	8,844	4,982	4,107

\* Included in "All other" to avoid disclosure of individual operations.

● **FACTORY USE SOYBEAN OIL.** Factory production of crude soybean oil in June was 141,705,000 lbs. compared with 169,001,000 lbs. in May, reports Bureau of the Census.

Factory consumption of crude soybean oil in June was 142,853,000 lbs., compared with 142,845,000 lbs. in May. Factory and warehouse stocks of crude soybean oil totaled 83,338,000 lbs. June 30; 91,462,000 lbs. May 31.

Factory production of refined soybean oil in June totaled 132,235,000 lbs. compared with 131,848,000 lbs. in May. Factory consumption of refined soybean oil totaled 120,525,000 lbs. in June; 125,688,000 lbs. in May. Factory and warehouse stocks of refined soybean oil totaled 77,528,000 lbs. June 30; 74,809,000 lbs. May 31.

Crude soybean oil entered into the following uses in June: soap 79,000 lbs.; paint and varnish 479,000 lbs.; lubricants and greases 41,000 lbs.; and other inedible 1,395,000 lbs.

Refined soybean oil was used as follows in June:

## Strategically Located

To give you prompt, courteous service on top quality "Purity Brand" Soybean Oil Meal

Expeller Toasted Soybean Oil Meal of uniform grind, golden color, and original nutlike soybean flavor.

## QUINCY SOYBEAN PRODUCTS CO.

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HEADQUARTERS FOR THE  
STANDARDIZED SOYBEAN LECITHIN  
SOLD UNDER THE RE-  
KNOWNED YELKIN TRADEMARK  
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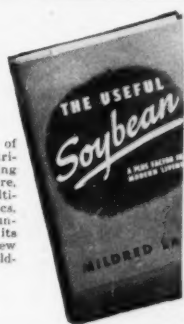
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By Mildred Lager

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32 figures and tables, \$3.00

This book brings you the dramatic story of the soybean, modern industrial and nutritional wonder crop, and the fascinating history of its oriental migration. Here, too, is a thorough examination of its multitude of uses in paint, varnish, plastics, rubber substitutes, wool, drugs, and hundreds of other products, and indicates its constant challenge to the chemist for new uses. Includes 350 vigor and health building recipes for soybean dishes.

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### **CALUMET** Super Capacity Elevator **CUP**

will help you do the job, and right. Its patented Logarithmic curve design has never been successfully imitated. Its performance has never been duplicated.

The world famed Calumet Cup is a hard worker, a fast and willing worker. It scoops up, elevates and **COMPLETELY** discharges super capacity loads. There's no wasteful blacklegging. No lost motion.

You can space the Calumet closer on belt . . . and **THAT** means increased capacity . . . speedier, more economical operation. And you can rely on the Calumet to function successfully over **ANY** sized pulley, at **ANY** permissible speed.

Of one piece welded construction, heavier gauge steel, the Calumet is a time tested battler with a fighting spirit that assures a long, long term of useful service.

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So, by all means buy Biwelco, if your requirements call for complete elevator legs, heads, boots and elevator legging . . . screw conveyor troughs . . . bins and sheet metal work to specifications.

Cost estimate and advice of our trained engineers free upon request.

## **B. I. WELLER CO.**

327 S. LaSalle St. Chicago, Ill.

36 Years Of Service To The Grain Trade

shortening 47,577,000 lbs.; margarine 1,854,000 lbs.; other edible 6,444,000 lbs.; paint and varnish 6,948,000 lbs.; lubricants and greases 14,000 lbs.; linoleum and oilcloth 1,932,000 lbs.; other inedible 5,408,000 lbs.

Hydrogenated edible soybean oil was used as follows in June: shortening 9,738,000 lbs.; margarine 19,478,000 lbs.; inedible products 4,000 lbs.

● **SUPPORT PROGRAM.** Farmers made greater use of price support on grains and related crops during the past year than in the 1948-49 marketing season. Production and Marketing Administration of U. S. Department of Agriculture reports.

Soybeans placed under price support during the 1949 marketing season totaled 16.1 million bushels compared with 10.5 million bushels for 1948.

Loans were placed on 11.3 million bushels in 1949 compared with 6.4 million bushels in 1948. Under purchase agreements in 1949 were 4.8 million bushels compared with 4.1 million bushels in 1948.

By late in May, 70 percent of 1949-crop soybeans placed under loan had been redeemed. Deliveries to CCC totaled only 13,000 bushels. As soybean prices since February have averaged well above the support price of 2.11 dollars per bushel, No. 2 yellow or green, practically all of the remaining soybeans under loan probably had been redeemed.

● **SOYBEAN GLUE.** Consumption of soybean glue by the softwood plywood industry in May totaled 4,025,000 lbs. compared with 3,727,000 in April, and 2,709,000 lbs. in May 1949, reports Bureau of Census.

Consumption of phenolic resin glue in May was 3,541,000 lbs. Total consumption of all glues by the plywood industry in May was 8,747,000 lbs.

Consumption of soybean glue in June was 4,325,000 lbs. Consumption of phenolic resin glue was 3,297,000 lbs.; and total consumption of all glues in June was 8,571,000 lbs.

Stocks of soybean glue June 30 totaled 2,527,000 lbs. compared with 1,369,000 lbs. June 30, 1949.

**INSPECTIONS.** Inspected receipts of soybeans showed little change in July but were about average, according to reports to the Department of Agriculture. Inspections totaled 3,086 cars compared with 3,634 cars in June and 2,782 cars the July average for the ten years 1940-49. Inspected receipts for October through July were 94,544 cars compared with 99,856 cars for the same months last season.

The quality of the soybeans marketed in July was about the same as for the preceding month. 73 percent grading No. 2 or better compared with 74 percent in June and 70 percent the July 10-year average.

● **SOYBEAN STOCKS.** Production and Marketing Administration's commercial grain stock reports for July and August.

	July 5	July 12	July 18	July 25
Atlantic Coast	887	894	726	447
Gulf Coast	47	2	2	2
Northwestern and Upper Lake	409	458	415	321
Lower Lake	3,425	3,283	3,635	3,785
East Central	859	584	1	299
West Central, Southwestern & Western	593	460	414	300
Total current week	6,170	5,571	5,193	5,154
Total year ago	3,294	3,399	3,251	2,853

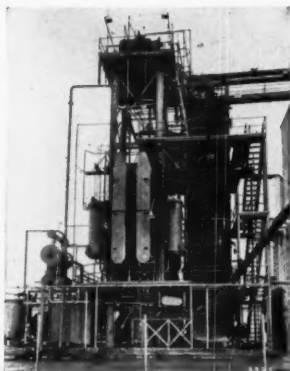
	Aug. 1	Aug. 8	Aug. 15	Aug. 22	Aug. 29
Atlantic Coast	425	389	307	246	246
Gulf Coast	2	2			0
Northwestern & Upper Lake	278	278	278	257	257
Lower Lake	3,721	3,200	2,985	2,673	2,673
East Central	247	205	191	193	193
West Central					
Southwestern & Western	252	156	2	54	54
Total current week	4,925	4,230	3,763	3,423	3,423
Total year ago	2,928	2,461	2,060	1,448	1,448

**SOYBEAN DIGEST**

# **Mechanical Screw-Press and Solvent Extraction Equipment**

Patented

*For all vegetable oil bearing seeds and nuts  
including soybeans, cottonseed, peanuts and flaxseed*



Outdoor type Solvent Extraction Outfit

- \* NEWEST IN DESIGN
- \* MOST EFFICIENT IN OPERATION

Capacity Standard Plants  
50 to 600 Tons Per  
24 Hour Day

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Largest Builders  
of Vegetable Oil Machinery in the World

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Has a background of half century building

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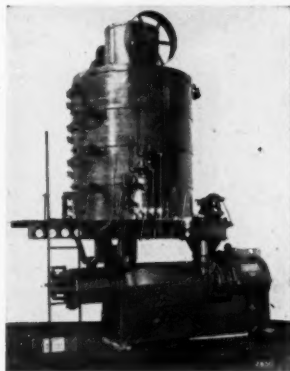
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SCREW PRESSES AND  
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Mechanical Screw Press with Four-High  
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A poorly packaged product is at the same disadvantage as a slovenly dressed salesman. Good appearance wins public favor, and it costs so little for your product to have it the Fulton way!

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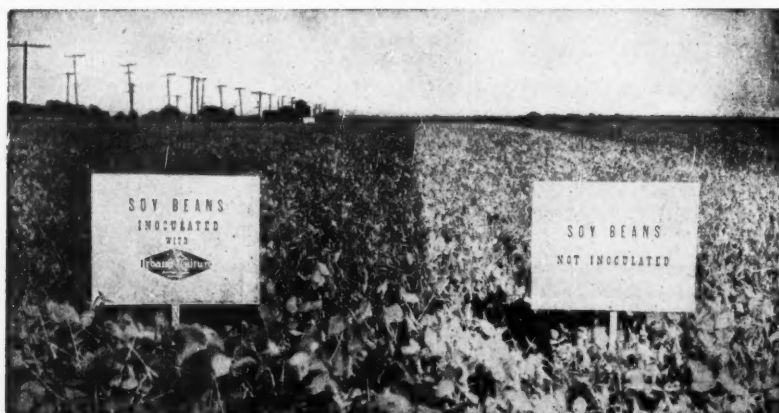
The Fulton branch near you will be glad to get your call for prices and information.

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**Urbana Culture**  
Superior Legume  
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Inoculate with Urbana Culture and efficiently utilize the free nitrogen of the air.

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**It pays  
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## **to Harvest your Beans with a Massey-Harris**

From every angle you're money ahead when you harvest your beans with a Massey-Harris. **YOU'RE MONEY AHEAD** in the actual harvest itself. A Massey-Harris gets more soy beans, in the same way it gets more of any of the 110 different crops it's designed to harvest.

Here's why. The cutter bar is adjustable from 11½ to 33 inches. You can actually skim the ground, without adding a special soy bean cutter bar.

**YOU'RE MONEY AHEAD** in the quality of your beans. They're cleaner, with fewer cracked ones—the kind of beans that brings top prices. The reason is the rasp-bar cylinder, developed by Massey-Harris, that rubs out the beans in a natural, easy way. Cylinder speed is quickly and easily adjustable to meet your crop and crop conditions.

### **For Larger Acreages—The Self-Propelled Clipper**

**YOU'RE MONEY AHEAD** for still another reason if you choose a Massey-Harris Self-Propelled Clipper. You save grain on the opening cut. You save manpower. You save fuel. You save time.

Proved in the million-acre Harvest Brigades, sponsored by Massey-Harris during the war, these savings have been confirmed in every harvest since.

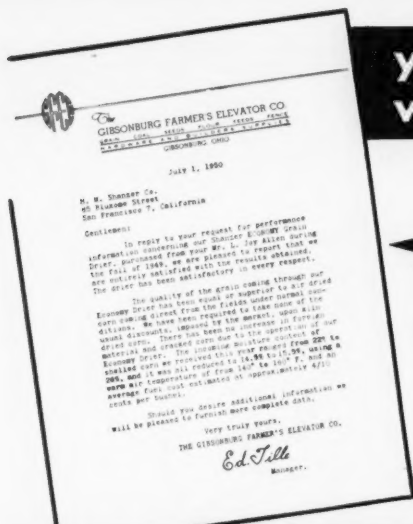
There's a Massey-Harris Combine to fit your farm. In addition to the 6- or 7-ft. p.t.o. Clipper, shown above, there are in Self-Propelled types, the 7-ft. Clipper, the new 10-ft. No. 26, and the 12- and 14-ft. **Super No. 27.**

Get the full facts about Massey-Harris Combines from your Massey-Harris dealer! For complete folder by mail write to Dept. J210

THE MASSEY-HARRIS COMPANY, Racine, Wisconsin

***Make it a Massey-Harris***



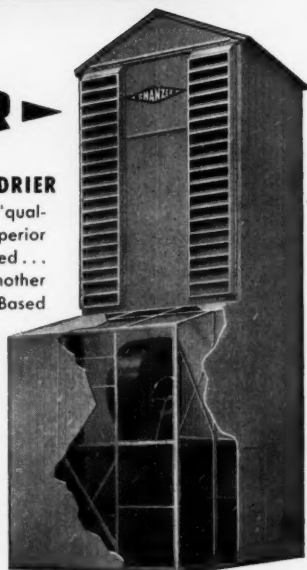


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**SHANZER**

**ECONOMY MODEL GRAIN DRIER**

insured his profits. As he says, "quality of the grain . . . equal or superior to air-dried . . . fuel cost estimated . . . 4/10 cents per bushel." Just another SHANZER SUCCESS STORY. Based on the BERICO time-tested principle of processing every kernel in warm air as it comes down free-flowing columns . . . improves quality, assures top market prices. You, too, can make bigger profits . . . write today!



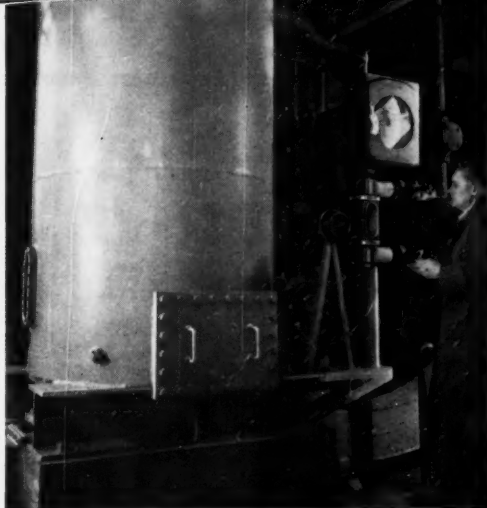
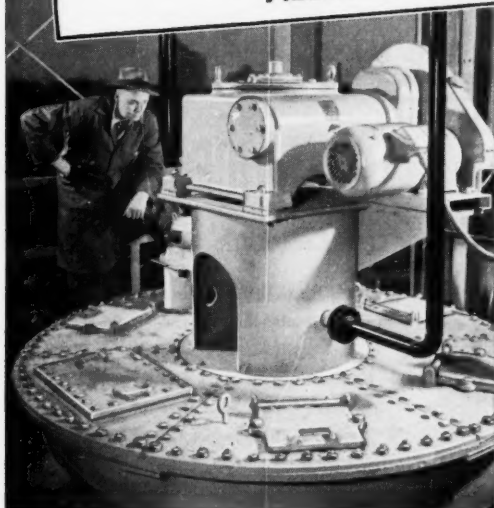
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**FORT WAYNE, INDIANA**

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When you buy an entire plant from A-C, you get the exact type and size of mill you want—designed to provide efficient, money-saving operation from top to bottom. And with the purchase of an entire plant you get individual process engineering plus *correlated* preparation, extraction, electrical, and pumping equipment.

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In cottonseed, soybean, corn germ, rice bran, and other products, Allis-Chalmers has pioneered in the production of solvent extraction equipment. Perhaps A-C can start *your* mill, too, on the road to greater profits. Mail handy coupon for complete information.

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SEPTEMBER, 1950

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Recent tests prove Soybean Oil Meal cooked at 15 lbs. steam pressure is superior in feeding values to dry toasted meals.

All our meal after cooking passes through toaster to conditioner. Frequent by-passes avoid regrinding, thus preventing floury meal, and gives it a very uniform texture.

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Special machinery designed and built for the job.

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**SCREW PRESSING EQUIPMENT CAN BE MADE TO LAST LONGER**

Worms, Cones, Jaws, Rings and Integral Shafts will hold their size and sharp edges for a longer time when hard-surfaced with our tough hard alloys. This permits the machines to operate more continuously with maximum efficiency as well as eliminating down-time and high replacements costs.

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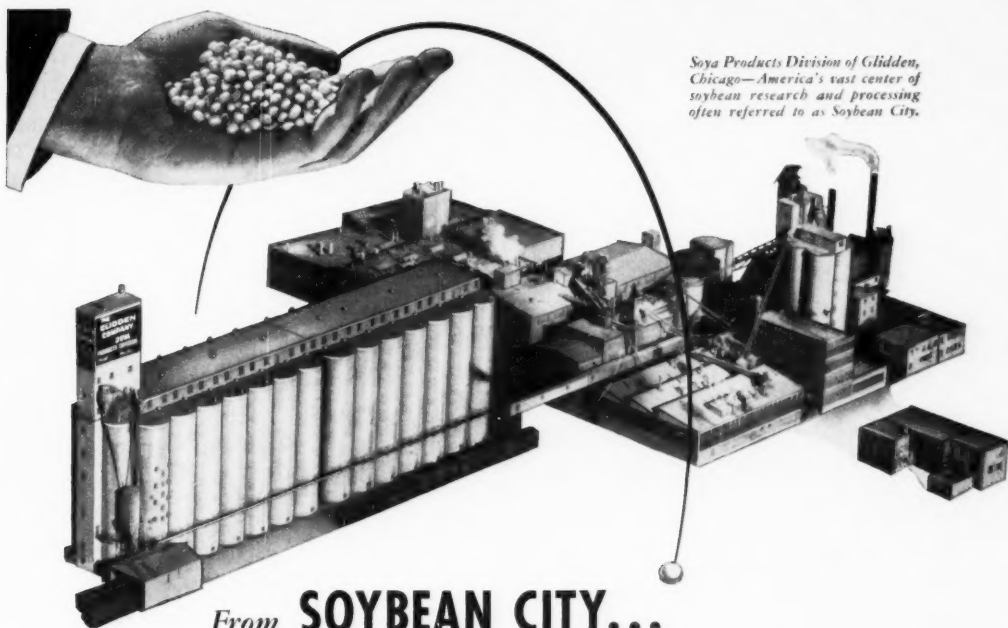
**ESSO STANDARD OIL COMPANY**—Boston, Mass.—New York, N. Y.—Elizabeth, N. J.—Philadelphia, Pa.—Baltimore, Md.—Richmond, Va.—Charleston, West Va.—Charlotte, N. C.—Columbia, S. C.—Memphis, Tenn.—Little Rock, Ark.—New Orleans, La.

### YOU CAN DEPEND ON ESSO HEXANE FOR

- **MULTI-STORAGE AVAILABILITY**—can be shipped promptly from Baytown, Texas, or Bayonne, N. J.
- **MODERN HANDLING METHODS**—separate tank storage, pumping lines, tank cars and trucks, are used in all Esso Solvent handling operations. Prompt, efficient delivery to your doorstep is assured.
- **UNIFORMITY**—made in modern refineries from carefully selected crude oil sources.
- **HIGH OIL RECOVERY**—results from "balanced solvency." Recovered oil has good color and refining properties.
- **EFFICIENT SOLVENT RECOVERY**—narrow boiling range (Typical 154°-161° F.) allows complete removal from extracted oil and meal.
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### FOR TECHNICAL ASSISTANCE

If you have a solvents problem or want further information on the specifications and characteristics of Esso Hexane—write or call our office nearest you. Our technicians will be glad to assist you.



## From **SOYBEAN CITY...**

*this fast-growing family of Food and Industrial Products!*

**EDIBLE SOYA PRODUCTS** for Baked Goods, Meat Products, Prepared Mixes, Candy, Restaurant Menus, Institutional Food Formulas and Canned or Dry Type Pet Foods: **SOYARICH FLOUR**—full-fat Soya Flour; **SOYAFLUFF FLOUR**—practically fat-free Soya Flour; **SOYALOSE FLOURS** No. 103 and No. 105—low-fat types of soya flour containing fat in form of lecithin, a pure vegetable product; **SOYABITS** No. 20-3 and No. 40-3—low-fat Soya Grits with lecithin added, sized for specific food uses; **SOYABITS**—practically fat-free Soya Grit in many sizes.

**PREMIUM ALBUSOY® (Soya Albumin)**—A superior water-soluble, proteinaceous, non-coagulating material used as a whipping and foaming agent in confectionery goods and other products.

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**GLIDDENOL**—A special soybean derivative having unusual emulsifying, viscosity-controlling, anti-oxidant, wetting and dispersing properties; used in baked goods, confectionery goods, processed food products, vegetable fats and oils and many other products.

**GLIDDOL**—Special soybean derivative for the petroleum industry, used in lubricating oils and motor fuels.

**INDUSTRIAL SOYA PROTEINS**—**ALPHA® PROTEIN**—Pure, isolated soya protein used in making paper, paint, rubber, floor coverings, leather, fire-fighting foam and other products. **PROSEIN®**—A mechanically refined protein product used as an adhesive or binder in making

paper, paint, floor coverings, insulating board and other products. **SPRAYSOY**—A special soybean product for use as a sticker and spreader in agricultural spray materials. **MULSOYA**—A water-soluble derivative of isolated soybean protein for textile sizing and for stabilizing emulsions.

**SPECIAL SOYBEAN OIL MEAL AND FLAKES**—For use in soybean adhesives.

**PROSIZE**—A superior process for sizing paper, utilizing Glidden Alpha® Protein.

**STEROID HORMONES**—**GLIDDEN TESTOSTERONE** (Crystalline) and **GLIDDEN TESTOSTERONE PROPIONATE U.S.P.** (Crystalline)—Principal male sex hormone and the ester, synthesized from soya stigmaterol, and used for replacement therapy of endocrine deficiencies. **GLIDDEN PROGESTERONE U.S.P.** (Crystalline)—An important female sex hormone synthesized from soya stigmaterol.

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**GLIDDEN PURE SOYA PHOSPHATIDES (Oil Free)**—For pharmaceutical use and many industrial applications.

**GLIDNOFOAM**—A specially prepared anti-foam agent.

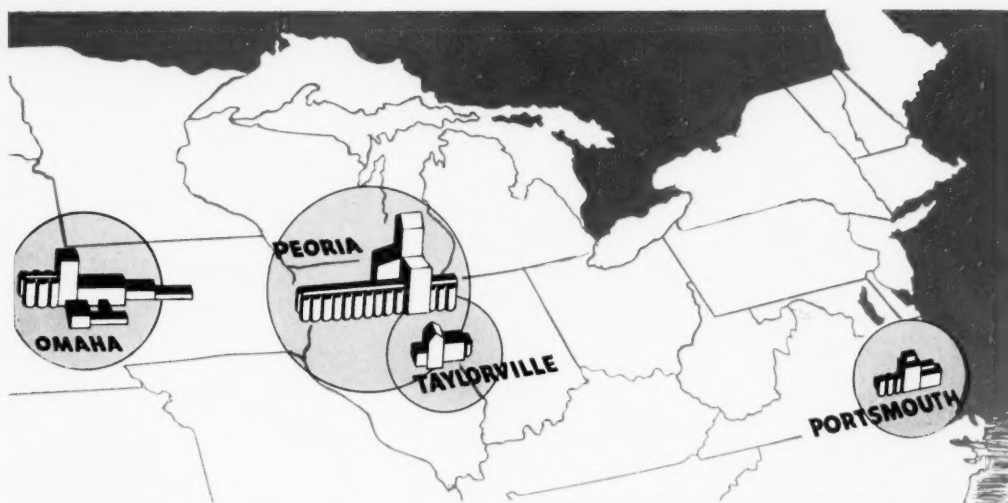
Glidden also produces 44% Protein Soybean Oil Meal and 41% Protein Soybean Oil Meal for use in formula feed manufacture; 30% Protein Extracted Soybean Feed for use as feed ingredient; and Crude Degummed Soybean Oils—extracted and expeller process.

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**The Glidden Company**  
SOYA PRODUCTS DIVISION

5165 West Moffat Street, Chicago 39, Illinois





## The Soybean Plants of Allied Mills "AT YOUR SERVICE"

Allied Mills conveniently located mills (see list below) provide dependable service to Soybean growers and users of Soybean Oil Meal, buying and selling Soybeans in truck or carload lots.



Furthermore, every bag of Wayne Feeds used furthers the cause of the Soybean industry... helps make Soybeans more profitable for YOU. Here's why—

...if Soybeans were bought for oil alone, the price would be far less. But by building volume use for Soybean Meal (as an important ingredient in Wayne Feeds) we help you realize greater profits.

...special Wayne Concentrates help increase the efficiency of on-the-farm Soybean feeding.

Day in and day out, our resources, facilities and specialized experience are "At Your Service" in building bigger and better returns from Soybeans for you.

### ALLIED MILLS, INC.

Executive Offices: Chicago 4, Illinois  
Service Offices: Fort Wayne 1, Indiana

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| 1. OMAHA, NEBR.<br>Feed Manufacturing<br>Soybean Processing    | 6. MEMPHIS, TENN.<br>Feed Manufacturing        |
| 2. PEORIA, ILL.<br>Feed Manufacturing<br>Soybean Processing    | 7. FORT WAYNE,<br>IND.<br>Feed Manufacturing   |
| 3. PORTSMOUTH, VA.<br>Feed Manufacturing<br>Soybean Processing | 8. BUFFALO, N. Y.<br>Feed Manufacturing        |
| 4. TAYLORVILLE,<br>ILL.<br>Soybean Processing                  | 9. COZAD, NEBR.<br>Alfalfa Processing          |
| 5. EAST ST. LOUIS,<br>ILL.<br>Feed Manufacturing               | 10. ELM CENTER,<br>NEBR.<br>Alfalfa Processing |
|  | 11. GREENVILLE,<br>OHIO<br>Cereal Plant        |